

## **SURVEY OF THE FISH RESOURCES OF ANGOLA**

**Survey of the demersal resources**

**01 – 31 March 2010**

**Institute of Marine Research  
IMR, Bergen  
Norway**

**Instituto Nacional de Investigação das Pescas  
INIP, Luanda  
Angola**



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The programme has previously conducted the following demersal surveys in the area:

January 1985	-	June 1986	(6 surveys)	
January 1989	-	December 1989	(3 surveys)	
May 1991	-	September 1992	(3 surveys)	
January 1994	-	March 2010	(18	surveys)





CRUISE REPORTS "DR. FRIDTJOF NANSEN"

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by

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## CHAPTER 1 INTRODUCTION

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### 1.1 Objectives

The objectives of the cruise had been previously discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação Pesqueira (INIP) of Angola, and the responsible from the Institute of Marine Research (IMR), Norway, for the Angolan Demersal Programme, and were the following:

- To survey, map and describe the distribution, composition and abundance of the main demersal species, with special emphasis on seabreams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merlucciidae) and shrimps (*Parapenaeus longirostris* and *Aristeus varidens*) on the Angolan shelf and slope (down to 800 m), from Cunene River (17°14'S) to Tombua\* (15°40'S), and from Benguela (12°35'S) to Congo River (06°00'S) using bottom trawl and the swept-area method.
- To collect biological data such as length, weight, sex and maturity stage of *Dentex macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *Pseudolithus senegalensis*, *Umbrina canariensis*, *Merluccius polli*, *Brachydeuterus auritus*, *A. varidens*, *P. longirostris*, *Chaceon maritae*, *Panulirus regius* and Cephalopods.
- To collect the stomach contents for some species such as *D. angolensis*, *P. bellottii*, *P. senegalensis*, *U. canariensis* and *B. auritus*, for subsequent analyses in the INIP Lab.
- To monitor the general hydrographical conditions using CTD-Sonde on each trawl station and map the temperature, salinity and oxygen.
- To carry out four monitoring lines (Namibe, Lobito, Palmerinhas and Congo River mouth) using INIP's new standard hydrographical profiles for collection of temperature, salinity and oxygen, water nutrients, phytoplankton and zooplankton.

\*The Tombua-Benguela region has been excluded in all the demersal surveys as the bottom is very steep and rocky and unsuitable for bottom trawling, however, the abundance of demersal species in the region is low as the shelf and the slope are very narrow. The trends in the time series of the demersal biomass estimates are therefore insignificantly affected by the exclusion of the region.

## 1.2 Participation

The scientific staff consisted of:

From INIP, Angola: Silvi Nsiangango (01.03-31.03, Local Cruise Leader), Virgílio Estêvão (01.03-31.03), Antonio Bucu (16.03-31.03), Fátima Delicado (16.03-31.03), Mário Fortunato (01.03-31.03), Pedro Panzo (01.03-16.03), David Quissungo (01.03-16.03), Manuel Domingos (01.03-31.03), Euzébio dos Santos (01.03-31.03), Margarida de Sousa (31.03-16.03), Fidel Quilanda (16.03-31.03), Domingos Pedro (01.03-16.03), Bomba Sangolay (01.03-31.03). Domingos Pedro (16.03-31.03),

From IMR, Norway: Jens-Otto Krakstad, Cruise Leader (16.03-31.03), Diana Zaera (01.03-31.03), Jan Frode Wilhelmsen (01.03-31.03), Thor Egil Johansson (01.03-31.03).

From UiB, Norway: Aksel Voldsund (16.03-31.03), Trond Pripp (16.03-31.03).

## 1.3 Narrative

R/V “Dr Fridtjof Nansen” departed Walvis Bay, Namibia, at noon the 1<sup>st</sup> March 2010 steaming northwards to the border between Namibia and Angola. We reached our working position over midnight the 3<sup>rd</sup> March, starting the sampling right away off Cunene River with trawl and hydrographic stations. A standard geographical allocation of the trawl stations to be taken during the Angolan demersal trawl surveys was implemented in 2003, and the station positions in the southern region have been similar in the 2000 and 2003-2010 surveys. The slope off Baía dos Tigres has not been adequately surveyed as the bottom is very steep and rough between 200 and 600 m. The 6<sup>th</sup> of March, during the afternoon, the survey of the southern region was finished, and the vessel headed to Baía dos Elefantes for calibration of the acoustic instruments. A hydrographical monitoring line was done off Namibe. Zooplankton was sampled with a multinet and phytoplankton with the bottles on the CTD. No trawling was carried out between the Tombua and Benguela as the shelf and slope are very steep and the bottom conditions are therefore not suitable for trawling.

The survey of the central region started early morning the 8<sup>th</sup> of March. Two monitoring lines, one off Lobito and another off Pta. das Palmerinhas, were carried out in this region. The vessel called on Luanda the 15<sup>th</sup> of March in the afternoon, to change crew and Angolan scientists. It departed 19<sup>th</sup> of March, at noon, to complete the coverage of the central region and continue the survey in the northern region. The survey of the central region was completed in the afternoon 20<sup>th</sup> March and the vessel continued to the northern region. One Angolan monitoring line was done at the Congo River in the northern region in addition to one standard “Nansen” transect off Ambriz. The survey of the northern region was completed in the afternoon 30<sup>th</sup> March and R/V “Dr. Fridtjof Nansen” called port in Luanda at noon 31<sup>st</sup> March.

The monitoring lines were carried out in accordance with the new standards for monitoring lines run by INIP, see Annex IX. These transects were selected according to the regional requirements as the Angolan monitoring lines (Namibe, Lobito, Ponta das Palmerinhas and the Congo River). The transects ended further off-shore and the distance between the stations

were longer than the standard “Nansen” transects. The depth intervals for plankton sampling were introduced in 2009 and repeated this year. Some of the standard “Nansen” transect were included in this year’s survey.

## CHAPTER 2 METHODS

### 2.1 Survey effort

Table 2.1 presents the surveyed area by depth strata, allocation of trawl stations, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed. Table 2.1 also shows the allocation of effort relative to the stratum size as percentage hauls versus percentage area, by depth, by region, and by total area. The overall average coverage was 1 valid trawl station per 86 square nautical miles (NM<sup>2</sup>). Figures 2.1-2.3 show the cruise tracks in the southern, central and northern regions, respectively, and the locations of bottom trawl, plankton and hydrographical stations.

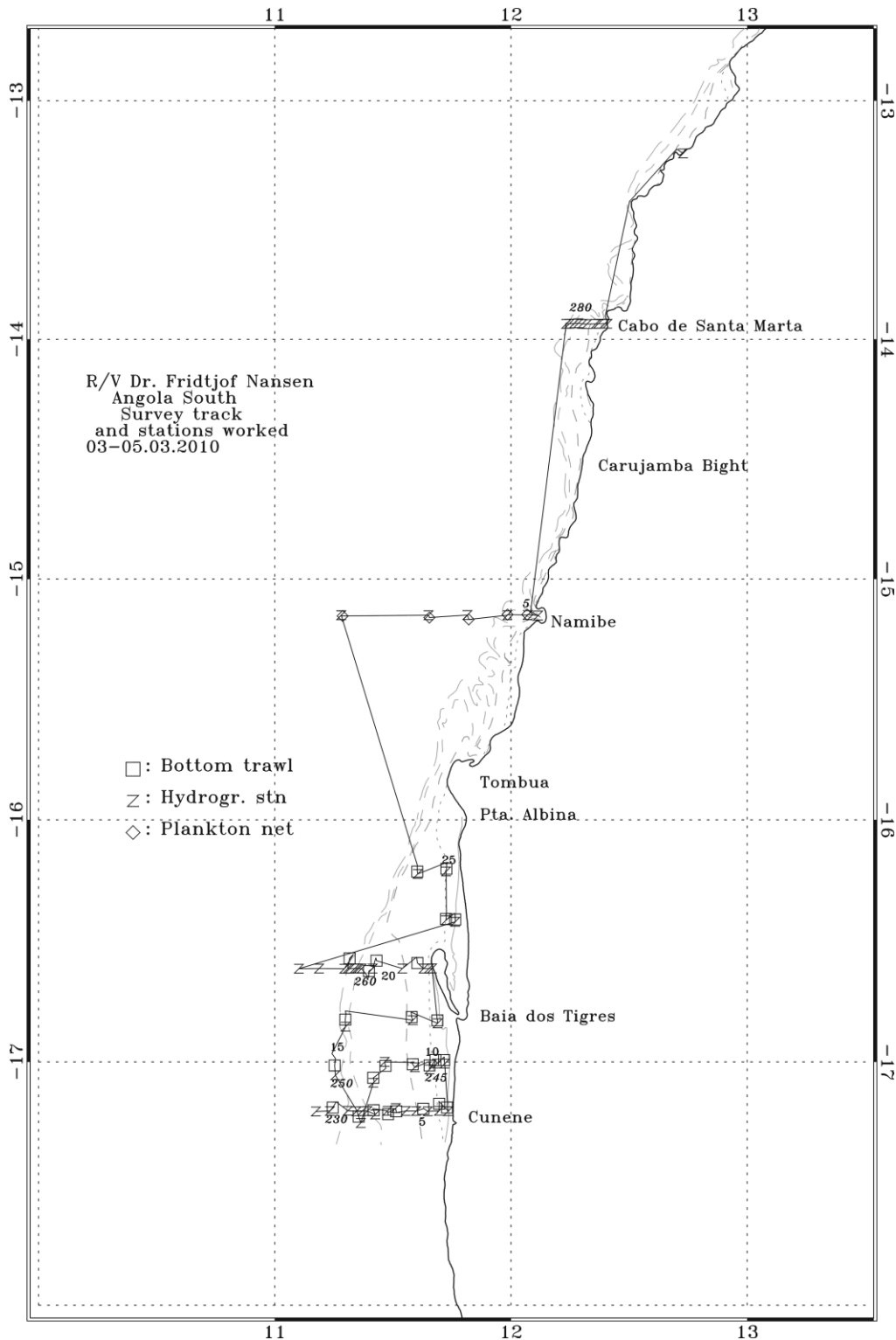
**Table 2.1** Survey's design and effort for the 2010 demersal survey. Size of the survey area by depth stratum, allocation of trawl stations, proportion of stations relative to stratum size, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed, divided in to: southern region (Cunene to Tombua), central region (Benguela to Luanda) and northern region (Luanda to Congo River).

Region	Depth strata (m)									Valid	Failures	CTD	Distance
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
<b>Cunene-Tombua</b>													
Area (NM <sup>2</sup> )	507	591	594	100	77	48	39			<b>1956</b>			
# hauls (BT)	8	6	7		2			1	2	<b>26</b>	1	60	577.1
% area	25.9	30.2	30.4	5.1	3.9	2.5	2	0	0	11.83			
% hauls	30.77	23.08	26.92	0.00	7.69	0.00	0.00	3.85	7.69				
<b>Benguela-Luanda</b>													
Area (NM <sup>2</sup> )	1068	1586	1439	407	372	343	346	268	357	<b>6186</b>			
# hauls (BT)	16	18	13	2	6	3	4	3	4	<b>69</b>		90	1098.8
% area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8	37.41			
% hauls	23.2	26.1	18.8	2.9	8.7	4.3	5.8	4.3	5.8				
<b>Luanda-Congo River</b>													
Area (NM <sup>2</sup> )	1379	1969	1940	601	550	437	409	408	702	<b>8395</b>			
# hauls (BT)	19	20	19	5	6	6	5	5	8	<b>93</b>	2	103	1360.24
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	50.76			
% hauls	20.2	21.3	20.4	5.3	6.4	6.4	5.3	5.3	8.5				
<b>Grand total</b>													
Area (NM <sup>2</sup> )	2954	4146	3973	1108	999	828	794	676	1059	<b>16537</b>			
# hauls (BT)	43	44	39	7	14	9	9	9	14	<b>188</b>	3	253	3036.14
% area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
% hauls	22.8	23.3	20.7	3.7	7.4	4.8	4.8	4.8	7.4	<b>Total hauls: 191</b>			

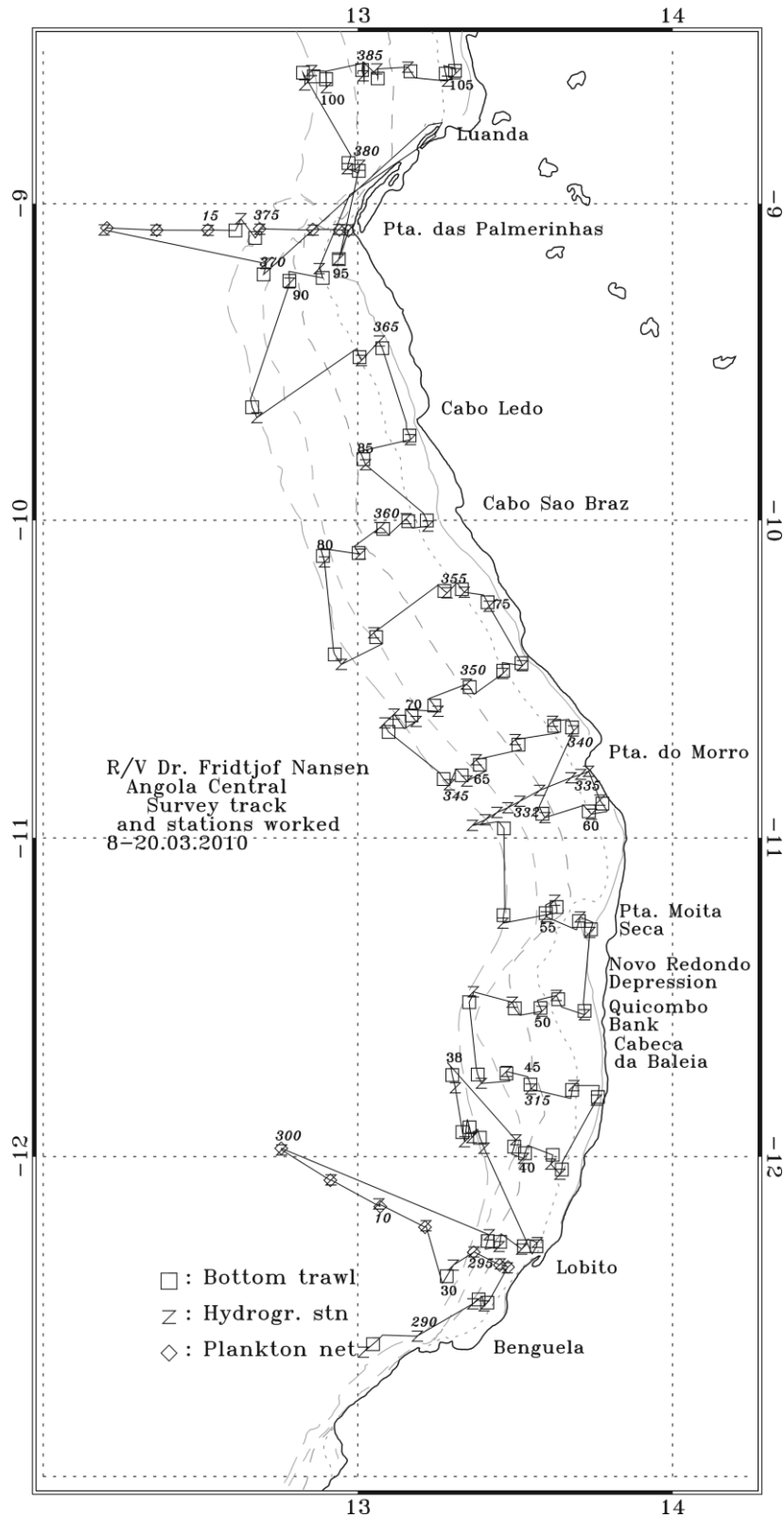
A stratified semi-random survey design was used with depth and area as stratifying variables. Trawling was carried out along transects perpendicular to the coast, which were approximately 15 NM apart (Figures 2.1-2.3), and the allocation of trawl stations was proportional to stratum size. Trawling shallower than 300 m was mainly done during daytime and deeper than 300 m during dark hours. The planned design is sometimes slightly modified due to unsuitable bottom conditions or, in the northern region, due to non-accessible areas with oil exploitation.

Based on a decision made in 2003 the trawl positions of the 2000 demersal survey should be the standard for future surveys in the southern region as the survey had a reasonable good

coverage. Furthermore, it was decided that the trawl positions of the 2002 demersal survey should be used as the standard for future surveys in the central and northern regions, as the survey had a good coverage of these regions. Therefore, the station positions and effort have been similar during the 2000 and 2003-2010 surveys in the southern region and during the 2002-2009 surveys in the central and northern regions (see Annex VIII).

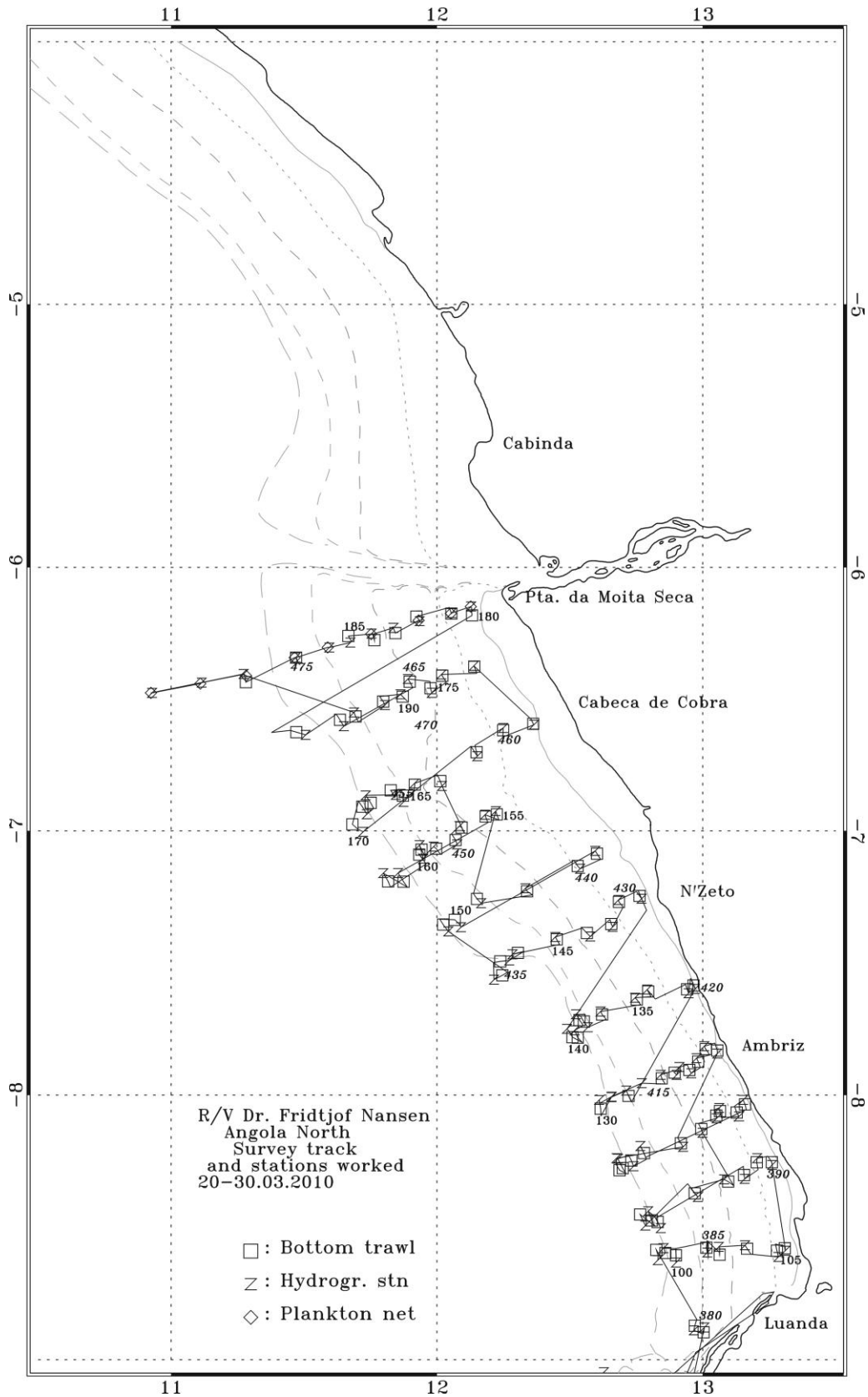


**Figure 2.1** Angola south: Cunene - Tombua. Course track with trawl stations, plankton stations and hydrographical stations.. Depth contours at 20, 50, 100 and 200 m.



**Figure 2.2** Angola central: Benguela - Ponta das Palmerinhas. Course track with trawl stations, plankton stations and hydrographical transects. Hydrographical stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.





**Figure 2.3** Angola north: Luanda - Congo River. Course track with trawl stations, plankton and hydrographical transects. Hydrographical stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.

## 2.2 Meteorological and hydrographical sampling

A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done with the customised Seabird Seasave software installed on a PC. Profile data were logged down to a few meters above the bottom or to 1 000 m depth at the Angola monitoring lines and at all trawl stations. Calibration data, both for oxygen and salinity, were from February 2010. The calibration formulas used were:

Oxygen:  $Y = 1,1535x - 0.6194, R^2 = 0.9937$

Salinity:  $Y = 1,0097x - 0.3265, R^2 = 0.997$

The SBE 21 Seacat thermosalinograph was running routinely during the survey, obtaining samples of sea surface salinity and relative temperature and fluorescence (5 m depth) every 10 seconds. An attached in-line Turner Design SCUFA Fluorometer continuously measured Chlorophyll A levels [RFU] at 5 m below the sea surface while underway during the entire cruise.

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged using a WIMDA meteorological station and averaged by every nautical mile distance sailed.

A vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments logged the current profiles continuously, and was set to ping synchronously with the echo sounders. The frequency of the VMADCP is 150 kHz, and data were averaged and stored in 4 m vertical bins in shallow water to approximately 400 m bottom depth and 8 m bins deeper than this.

## 2.3 Biological sampling

### *Sampling gear*

A Gisund Super bottom trawl with a headline height of about 4.5 m was used during the survey, and the doors are of the Thyborøn' combi type. The distance between the front parts of the wings was about 21 m during deployment at a speed of 3 NM h<sup>-1</sup>. These settings have been the standard on all swept area surveys with R/V "Dr. Fridtjof Nansen". As in previous surveys, except during the 2002 survey, a 44 m long tickler chain was attached to the footrope on depths of more than 300 m in order to catch more of the bottom dwelling deep-water shrimps. During all tows deeper than 80 m, a 9 m long constraining rope was attached between the wires 120 m in front of the trawl doors. This kept a constant distance between the doors of about 50 m during the trawling. In shallow stations with depths of less than 80 m, the door-to-door distance varied more, depending on bottom type and currents. Data from the door and depth/trawl-height sensors were logged for all tows and are stored in files with CMG format, which makes it possible to study the trawl performance in more detail.

Trawl duration was standardized to 30 minutes. The trawling start time is controlled by using SCANMAR sensors to detect the landing of the trawl on the bottom, and the stop-time is defined as the time when the wires start to haul the net. In some cases the towing was interrupted before 30 minutes either due to poor bottom conditions or too high catches of fish

indicated by the installed catch sensors. If the stations were not trusted to reflect the density of fish on the bottom they were recorded as invalid in the Nansis database. Table 2.1 shows the numbers of valid and invalid stations. A detailed description of the fishing gear is given in Annex VII.

### *Sampling the catches*

Catches were sampled for species composition by weight and numbers. The total body length of the fish (cm) was measured to the nearest 1 cm below, the carapace length of shrimps and carapace width of crabs to 1 mm below and the mantle length of squids to 1 cm below. The records of fishing stations are presented in Annex I. For commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II.

## **2.4 Acoustic sampling**

Acoustic recordings were carried out at four frequencies: 18, 38, 120 and 200 kHz using a SIMRAD ER60 echo sounder. Acoustic data were not processed on board, but all data were stored to files. A detailed description of the acoustic settings is given in Annex VII.

## **2.5 Plankton sampling**

### *Zooplankton*

The sampling was conducted by means of HYDROBIOS Multinet with 5 nets at the monitoring lines. The nets (180  $\mu$ m) were remotely opened from the bridge of the vessel. The depth intervals covered in 2010 were the same as established in 2009: 200-100 m, 100-75 m, 75-50 m, 50-25 m and from 25 m to the surface. In the case of stations shallower than 25 m, the sample was taken from the bottom and up to the surface. A SCANMAR depth sensor gave real-time information of the depth and a flow meter inside the net was used to estimate the sampling volume. The samples were preserved in 4% formalin to be taken to the INIP for further analysis.

### *Phytoplankton*

Phytoplankton samples were taken at each CTD station of the monitoring lines at five different standard depths, as defined in 2009: 5 m, 15 m, 25 m, 50 m and 75 m depth. The samples were preserved in 4% formalin for further analysis in the INIP.

## **2.6 Areas and depth strata**

Table 2.1 shows the areas, in  $\text{NM}^2$ , for the southern region (Cunene - Tombua: S17°14'-S16°00'), the central region (Benguela - Ponta das Palmerinhas: S12°40'-S09°00') and the northern region (Ponta das Palmeirinhas - Congo River: S09°00'-S06°00') by depth strata. These strata are used to calculate the swept-area biomass estimates. All valid stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

## 2.7 Calculations

All equations for the calculations are given in Annex IV. The effective fishing width of trawl gear used by R/V “Dr Fridtjof Nansen” is considered to be 18.5 m. The effective fishing area is the product of the fishing width multiplied by the towing distance measured by the GPS. It is assumed that all fish within the trawling path are caught, which gives a catchability coefficient ( $q$ ), *i.e.* the fraction of the fish encountered by the trawl that was actually caught, equal to 1.

The catchability coefficient is seldom known, but because the coefficient is assumed to be constant between surveys, the swept-area estimates will reflect any change in population abundances between surveys.

The survey design and effort were previously inconsistent, and made any comparison between surveys difficult. Therefore, it was discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação das Pescas of Angola, and the responsible for the Angolan Demersal Programme at the Institute of Marine Research, Norway that all biomass estimates since 1985 should be calculated in a standardized procedure.

Data from the Nansis database were exported to flat ASCII text files. The software R 2.2.1<sup>⊗</sup> was used to calculate stratified density estimates sorted by survey and stratified by depth and latitude. Biomass estimates by species or species groups were obtained from a stratified mean density estimator using the equations in Annex IV.

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<sup>⊗</sup> R Development Core Team (2005). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org>.

## CHAPTER 3 OCEANOGRAPHIC CONDITIONS

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### 3.1 Surface distribution

The salient feature of the hydrographical conditions in Angolan waters between December and March is the drop in the salinity at the surface, associated to the seasonal rise in the precipitation over the continent and the consequent increase in the discharge of freshwater carried to the ocean by the Congo River and by other rivers along the Angolan coast. The regular demersal surveys carried out by R/V “Dr. Fridtjof Nansen” in March are coincident with the late phase of the wet season and, typically, it is observed low salinity in the surface waters in the shelf off the northern and central Angola regions.

#### Southern Region

The horizontal distribution of both temperature and salinity parameters in the southern region was dominated by the zonal transport of surface waters from offshore to the coast. And this phenomena was more pronounced in the Namibe zone. The main feature of this zonal transport was the presence of tropical waters characterized by high temperature (24.5 °C) and high salinity content ( $S > 36$ ), showing a different scenario in the southern region compared to last year in the same period. The temperature at the surface ranged from 24.5 °C and 20.5 °C being the maximum and minimum values found in areas of Namibe and Kunene River respectively. Similar distribution for salinity was also observed in Namibe area with  $S \geq 36.2$  and  $S \leq 35.55$  in the Kunene River area.

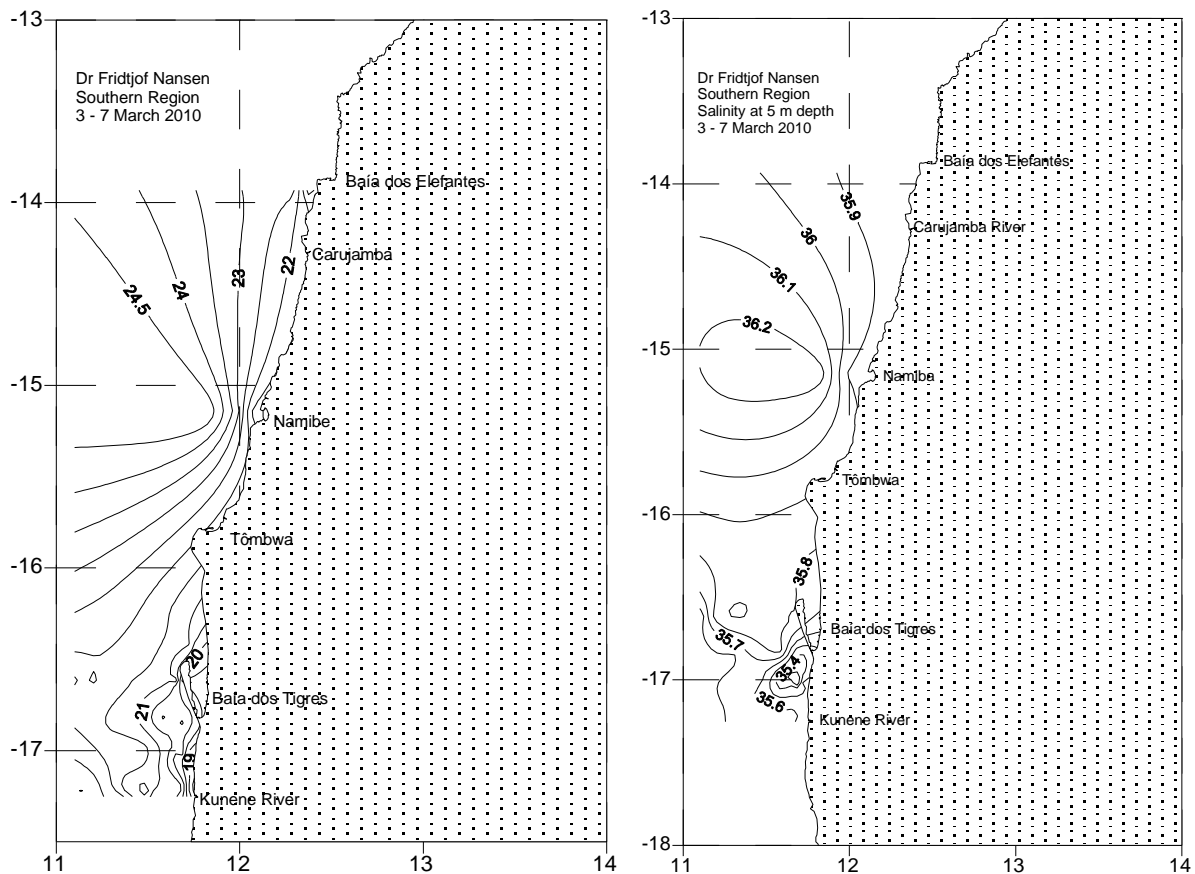
#### Central Region

The figures 3.2 a-b show the temperature and salinity signature at 5 m depth. As it was observed in the Namibe area of the southern region, in both cases, zonal transport of surface water took place in entire central region except in the northern area of this region (from Cabo Ledo to Ponta das Palmeirinhas). The temperature ranged from 24°C to 28°C rising from coast to offshore and salinity is decreasing northwards. The lowest values of both temperature and salinity were found near the coast probably due to the freshwater intrusion from coastal rivers (Catumbela, Longa, Keve and Kwanza) increased by rainfalls of the region. This saline front is clearly shown by the horizontal distribution of salinity in the Ponta das Palmeirinhas area where there has been a real front saline between the less saline waters coming from the Congo River and the high saline waters resulting from mixing of marine waters and the Kwanza River waters. Both water masses flowing in opposite directions create the seasonal saline front area which is the characteristic pattern of this region during summer period. Another important feature is the presence of gyres near the coastal rivers mouth area possibly due to increased outflows resulting from heavy rains in the land.

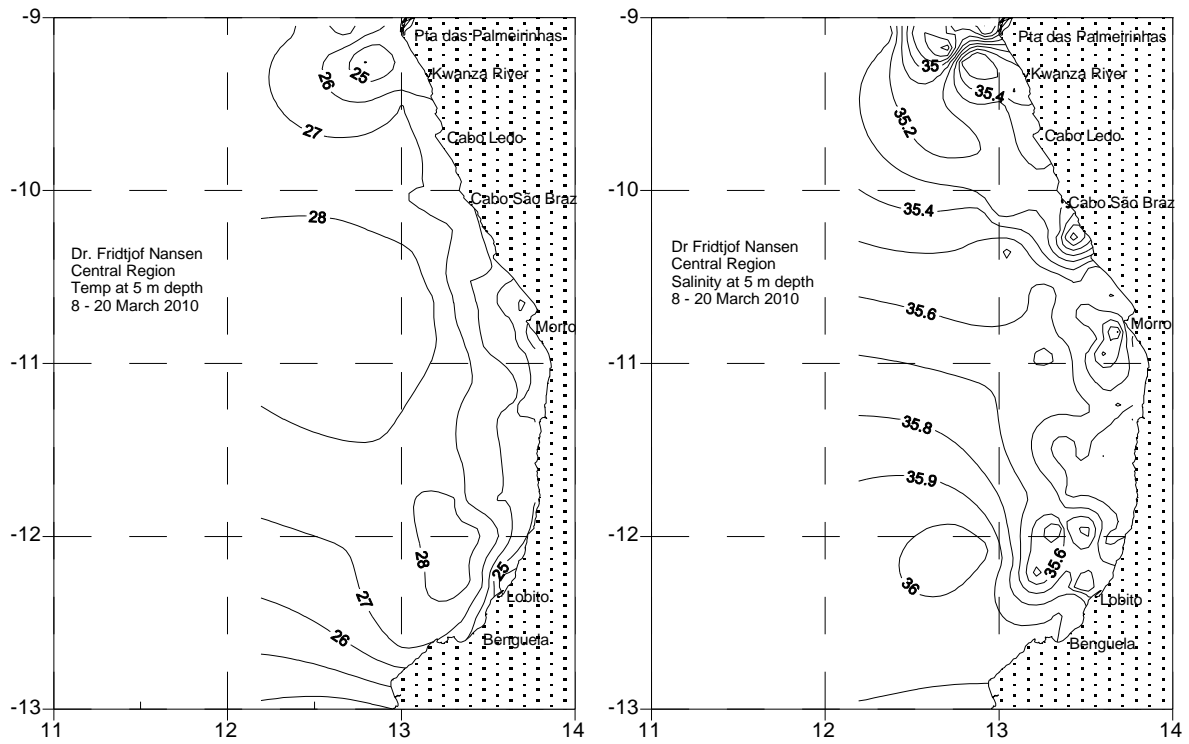
The characterization of surface waters of the northern region was similar to other regions of the Angolan coast. This similarity consisted in the transport of surface water flowing towards the coast. However this zonal transport met a counter-current carrying inshore coastal waters offshorewards. This phenomenon is most evident in the N'zeto area where the shape of isohalines and the isotherms indicated the strength of this counter-current coastal as well as weakness of that counter-current in the area of Ambriz.

We also observed that all off the north was dominated by the presence of surface water with lower salinity ( $S < 30$ ) indicating that the water coming from the Congo River flowed north and then back south through the Angola current by offshore.

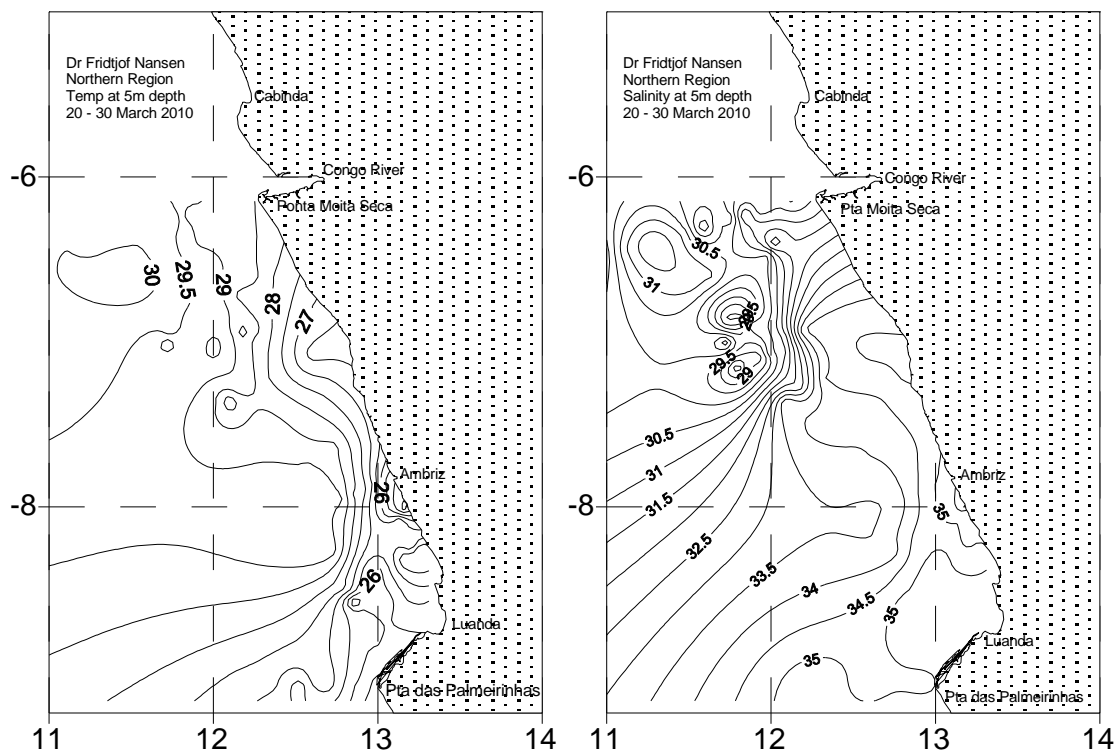
Gyres obtained in the south off the Congo River mouth were characterized by highest temperature ( $30^{\circ}\text{C}$ ) and lowest salinity ( $S \leq 28.5$ ) content in the center than in the surrounding areas. It was observed that as the temperature increased from coast to open sea, the salinity decreased offshorewards. The results showed that the year 2010 was warmer ( $30^{\circ}\text{C}$ ) compared with  $29^{\circ}\text{C}$  last year.



**Figures 3.1** – Surface distribution (5 m depth) of a) temperature and b) Salinity in the Southern region



**Figures 3.2** – Surface distribution (5 m depth) of a) temperature and b) Salinity in the Central Region



**Figure 3.3.**-Surface distribution (5 m depth) of a) temperature and b) salinity in the Northern region



### Vertical sections

In the southern region 4 transects (Kunene, Baía dos Tigres, Namibe and Carujamba) were effectuated (Figure 3.4 - 3.7). The surface layer (up 50 m depth) of all transects in the southern region showed the occurrence of a weak upwelling phenomena. Downwelling took place in the stations 261 and 264 of Baía dos Tigres section, located beyond the break continental shelf, and its effect reached the water column up to 400 m depth.

The surface layer of the southern region was characterized by high values of oxygen (from 6 to 5 ml/l) content which experienced a rapid depletion from 15 to 20 m depth with the exception of transect of the Kunene River. The lowest level of oxygen ( $\geq 0.5$  ml/l) was located between 150 and 350 m depth and then gradually increased again towards deeper waters. It was also observed a correlation between the thermocline and oxycline in the upper 50 m, this correlation consisted of progressive decrease in depth of both temperature and oxygen parameters.

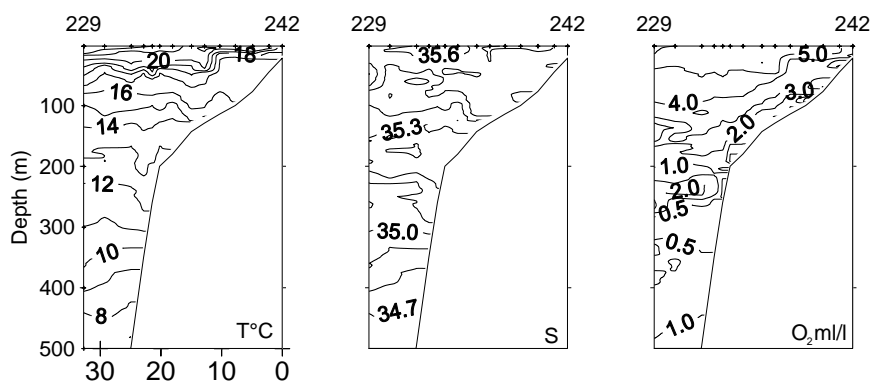


Figure 3.4. Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen off Cunene River

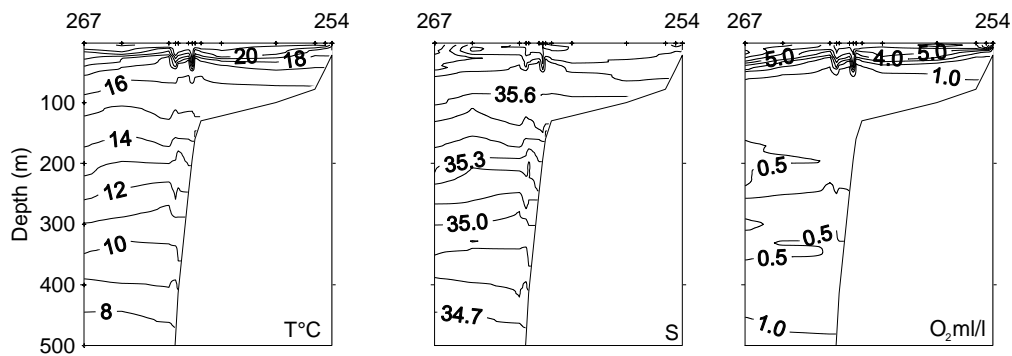
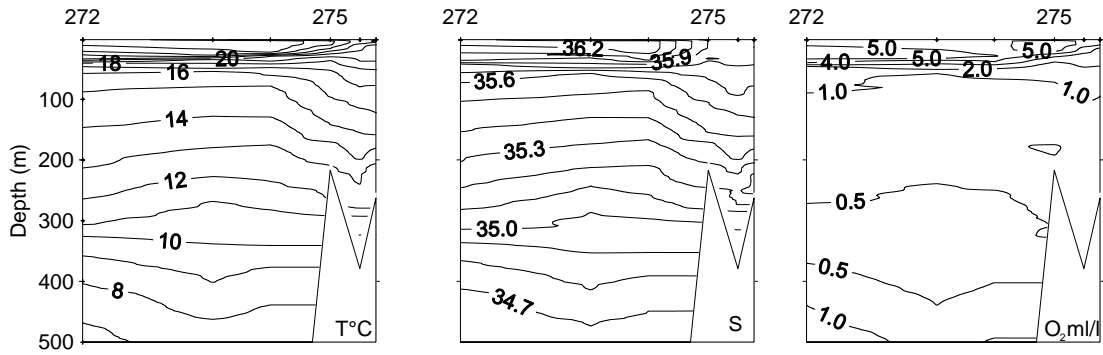
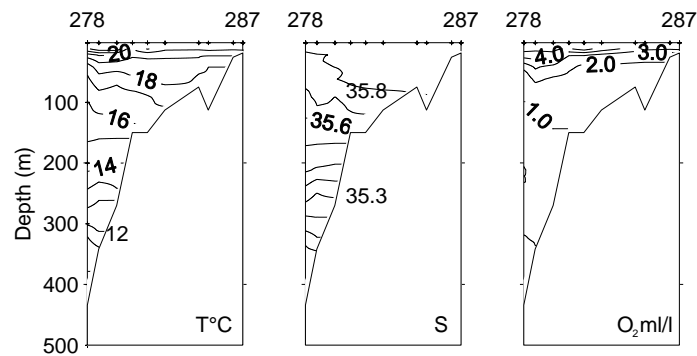


Figure 3.5. Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen off Baía dos Tigres



**Figure 3.6** Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen off Namibe.

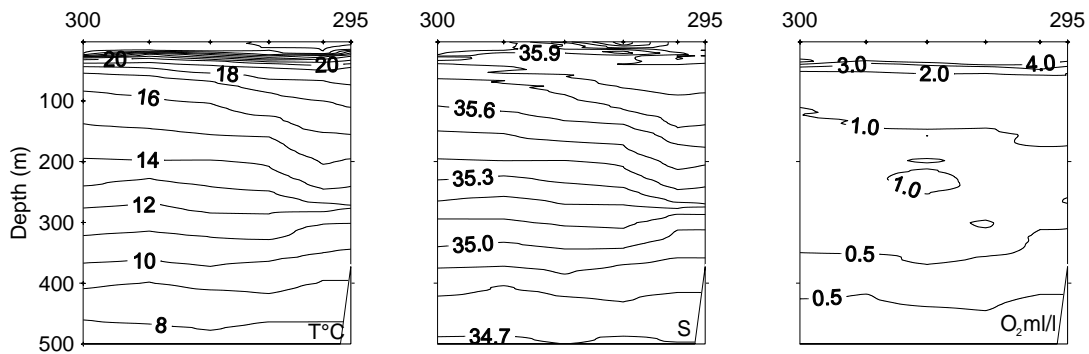


**Figure 3.7** Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen off Carujamba

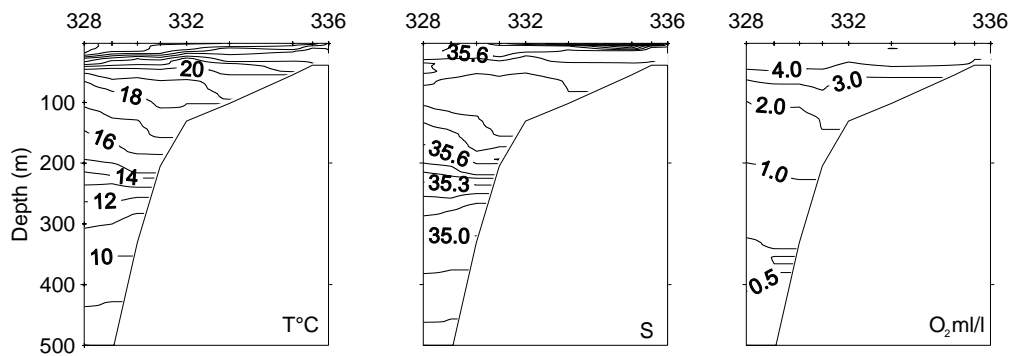
In the Central region (Figure 3.8 - 3.10), the mixed layer (0 – 20 m) appears very homogeneous in the transect off Lobito indicating the absence of turbulence in the surface layer (above 10 m depth). High values of temperature (28°C) and salinity ( $S \geq 36$ ) were observed in this area, generally located between 10 and 30 m depth which showed the characteristic pattern of tropical waters during summer.

Meanwhile, the surface layer in the transects of Ponta do Morro and Ponta das Palmeirinhas was characterized by waters of low temperature (26°C) and low salinity ( $S < 35$ ) showing the effect of turbulence of the water possibly caused by the intrusion of the rainfalls through the rivers. This mixture of surface water justified the stratification observed in transects mentioned above (Pta do Morro and the Pta das Palmeirinhas). The location of waters with highest salinity ( $S \geq 35.8 - 36$ ) in sub-surface layer was also observed in these two transects. The interaction of the two water masses of different salinities and densities in the surface layer created underwater turbulence and mixing that naturally caused the coastal system to be more stratified.

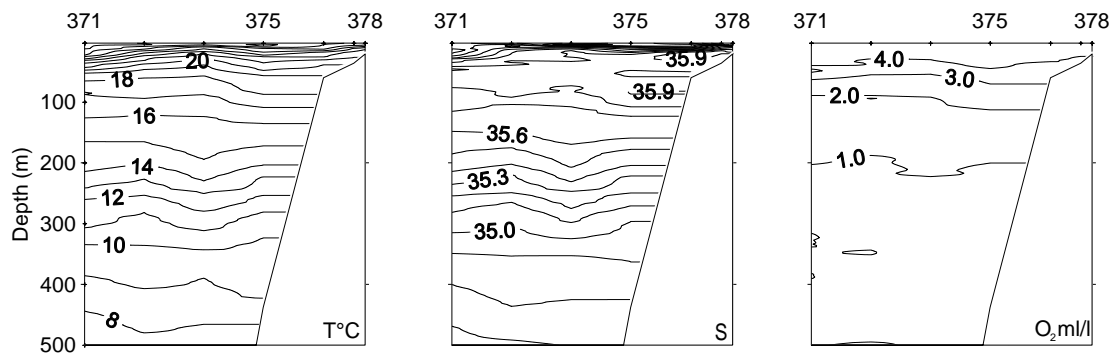
The oxygen content did not change much in the three transects in the central region. The surface layer was dominated by waters of 4.5 ml/l  $O_2$ , the minimum value of oxygen (0.5 ml/l) was located between 350 and 450 m depth.



**Figure 3.8** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen off Lobito.



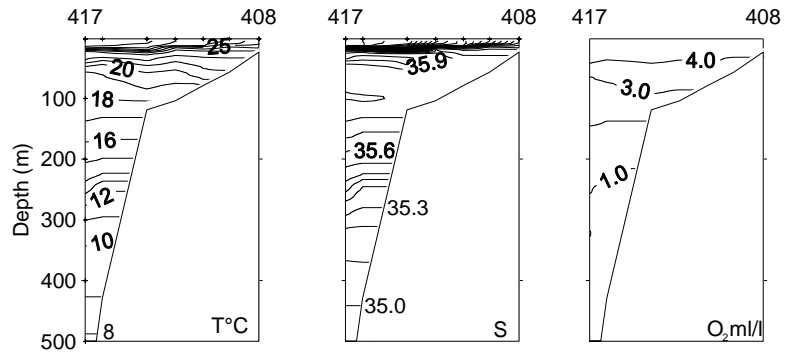
**Figure 3.9** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen off Pta. do Morro.



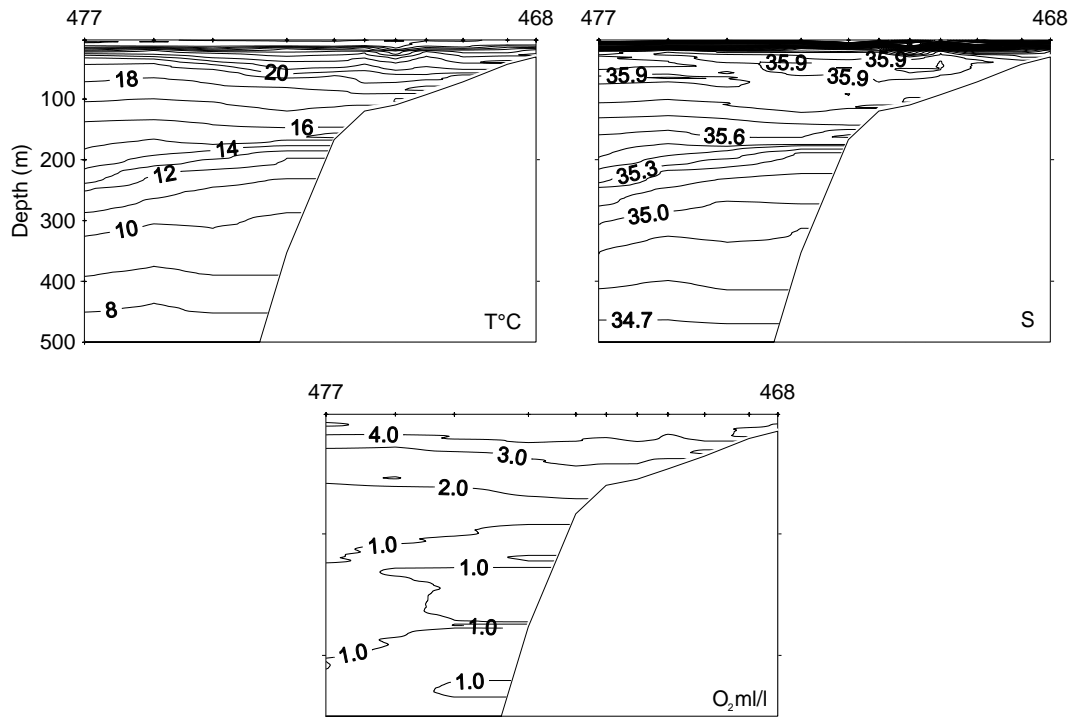
**Figure 3.10** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen off Pta. das Palmerinhas.

In the northern region two transects were done (Figure 3.11-3.12); one standard “Nansen” transect off Ambriz and one monitoring line at the Congo River (Pta. da Moita Seca). The result of the vertical distribution of salinity in the transects in the northern region confirmed the description given on the circulation of water from the Congo River. Laminar layers of surface waters in N'zeto and Ambriz transects showed thicker halocline (0 - 25 m) than at the Congo section (0 - 10 m). This implies that the waters from Congo have a greater impact in the N'zeto and Ambriz areas than in the area close the mouth of the Congo River.

Also in this region the tropical waters were located in the sub-layer from 30 to 50 m. The highest temperature value (30°C) was found in the Congo River and N'zeto transects and the value of 4.5 ml/l dominated throughout the continental shelf off the Angolan coast. The minimum oxygen content in the northern region was 1.0 ml/l.



**Figure 3.11** Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Ambriz.



**Figure 3.12** Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen off Pta. da Moita Seca.

## CHAPTER 4 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEMERSAL RESOURCES ON THE SHELF

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The inner shelf is defined to be the area between 20 and 70 m bottom depth, and the outer shelf from 71 to 200 m depth. Several of the species, which inhabit the shelf, particularly the seabreams (Sparidae) and hakes (Merlucciidae), are also found in deeper waters usually in small density. These are presented in Chapter 5.

The trawl positions are mapped in Figures 2.1-2.3, and the station information and catch by species are presented in Annex I. Pooled length distributions, weighted by the catch of the main species by region, are shown in Annex II. Further, the mean densities (tonnes·NM<sup>-2</sup>) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various Nansis species codes used for species and groups of species, and Annex VI presents the catch rates of these species and species groups.

### 4.1 Cunene-Tombua shelf

During 3 days 26 trawl stations were sampled on the southern shelf. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2010 surveys. Other surveys' results in the time series should therefore be interpreted with caution, as the strategy and design of these surveys were not standardized.

Some trawl stations were interrupted (see Annex I) as high catches of horse mackerel and sardinella affected the trawl performance, and may have prevented an adequate sampling of the catch on the shelf.

The average total catches per hour on the inner shelf were 11 527 kg/hour and 7 414 kg/hour on the outer shelf (Annex VI). The 'pelagic' group dominated with 80% of the mean catch rate on the inner shelf and 92% on the outer shelf. The mean catch rates of the 'demersal' group were respectively 99 kg/hour on the inner shelf and 357 kg/hour on outer shelf. Shrimps were only caught in low numbers at one station on the outer shelf. The average mean catch rates were 71 kg/hour for cephalopods and 3 kg/hour for sharks on the inner shelf, while on the outer shelf they were 54 kg/hour for cephalopods and 4 kg/hour for sharks. The "other" group of species contributed to 18% of the average mean catch rate on the inner shelf and <1 % on the outer shelf.

The 'pelagic' group was the most predominant on the inner shelf. *Sardinella aurita* dominated with 43% of the total catch and mean catch rates of 5 000 kg/hour, followed by *Trachurus capensis* who had mean catch rates of 3 460 kg/h and 30%. *T. trecae* had lower catch rates of 571 kg/hour. The seabreams (except *Boops boops*) was the most dominant demersal group, mainly because of one relatively big haul of *Lithognathus mormyrus*. The average catch rate of croakers (mainly *Umbrina canariensis*) was 15.2 kg/hour. No *Merluccius capensis* was found within the depth region.

Among the demersal species on the outer shelf, seabreams and mainly *Dentex microphthalmus*, was the most abundant. This group had average catch rates of 270 kg/hour. Cape hake (*Merluccius capensis*) was caught at eight of twelve stations with an average catch

rate of 92 kg/hour. The average catch rate of croakers (mainly *Umbrina canariensis*) was 1.5 kg/hour. No grunts, snappers or groupers were caught on the shelf in the south.

### *Biomass estimates*

Table 4.1 shows the time series from 1986 to 2009 of swept-area biomass estimates for commercial species in the southern region. The biomass estimates were calculated by stratifying depth (20-49, 50-99 and 100-199 m). The sampling intensity in the southern region has been variable throughout the years and only surveys that have covered each of the strata with at least two stations are included in Table 4.1. The high coefficient of variations (CV) shown in Table 4.1 indicates that the trends in the time series should be interpreted with care.

During the 2010 survey an estimated biomass of 286 000 tonnes of horse mackerel was obtained in the southern region of Angola. Of this, approximately 77 000 tonnes was *T. trecae*. In 2009 the total estimate of horse mackerel was 322 000 tonnes, which is the highest estimate in the time series, almost 50% higher than in 2008 and three times higher than the 2007 estimate. However, the swept-area estimates of the pelagic stocks are unreliable as the bottom trawl only catches fish close to the seabed. The contribution of *T. trecae* was 93% in 2007, 78% in 2008 and 99.9% in 2009 while this year it was considerably lower with only 27%. Small fish or juveniles (<25 cm) dominated the catches of both horse mackerel species also this year.

The seabreams biomass estimate was about 9 200 tonnes in which *D. macrophthalmus* contributed 86% to the catch. This was almost the same as estimated both the two previous years, and among the lowest estimates in the time series.

The biomasses of croakers have varied considerably during the last surveys. Therefore, no clear trend in the time series can be seen. However, the 2010 estimate of 321 tonnes is the lowest in the time series followed by two low estimates in 2009 and 2008, with 700 tonnes and 400 tonnes respectively. *A. hololepidotus* and *U. canariensis*, were the most abundant.

The biomass estimate of hakes (Benguela and Cape hakes) was 2495 tonnes. With the exception of the unusually high estimate of 31 000 tonnes last year the 2010 estimate is in line with previous year's. *M. capensis* (Cape hake) dominated the hake catches with 99% while *M. polli* (Benguela hake) was only caught in one station on the southern shelf during the present survey.

The biomass estimate of the cephalopods in 2010 was 1700 tons in 2010. In 2009 the estimate was 1 000 tonnes while it was 3200 tonnes in 2008.

The biomass estimate of sharks (includes Chimaeriformes) was about 190 tonnes in 2010. This estimate is the second lowest since 2000 and there has been a continues decreasing trend since the peak in 2006. In 2009 and 2008 approximately 300 tons of sharks were estimated in this region But this figures should carefully interpreted, as they do not reflect neither the real species composition nor their biomass due to inadequate sampling gear.

The biomass estimates of the pelagic species groups are unreliable, as the bottom trawl is not a very suitable sample tool for these groups. The 2010 biomass estimates of clupeids of 100 000 tonnes is the second highest in the time series but fluctuations are large as can be

illustrated by the very low biomass estimates (all <3000 tonnes) between 2007 - 2009. The large fluctuations in the time series do not reflect the true change of abundance of these stocks due to their ecological conditions. Similar, the fluctuations in the scombrids biomass estimates over time are unlikely to represent a reliable reflection of changes in the stock. The biomass trend of the carangids, 286 000 in 2010, was reflected in the horse mackerel time series as no other carangid species was caught in significant numbers in the southern region this year.

The biomass estimate of hairtails (*Trichiurus lepturus*) was about 148 tonnes, -the highest since 2005. However, as a benthopelagic species, its biomass estimates over time is unlikely to represent a reliable reflection of changes in the stock.

**Table 4.1** Biomass estimates (tonnes) of important species on the shelf (20-200m) in the southern region. CV values are indicated in brackets.

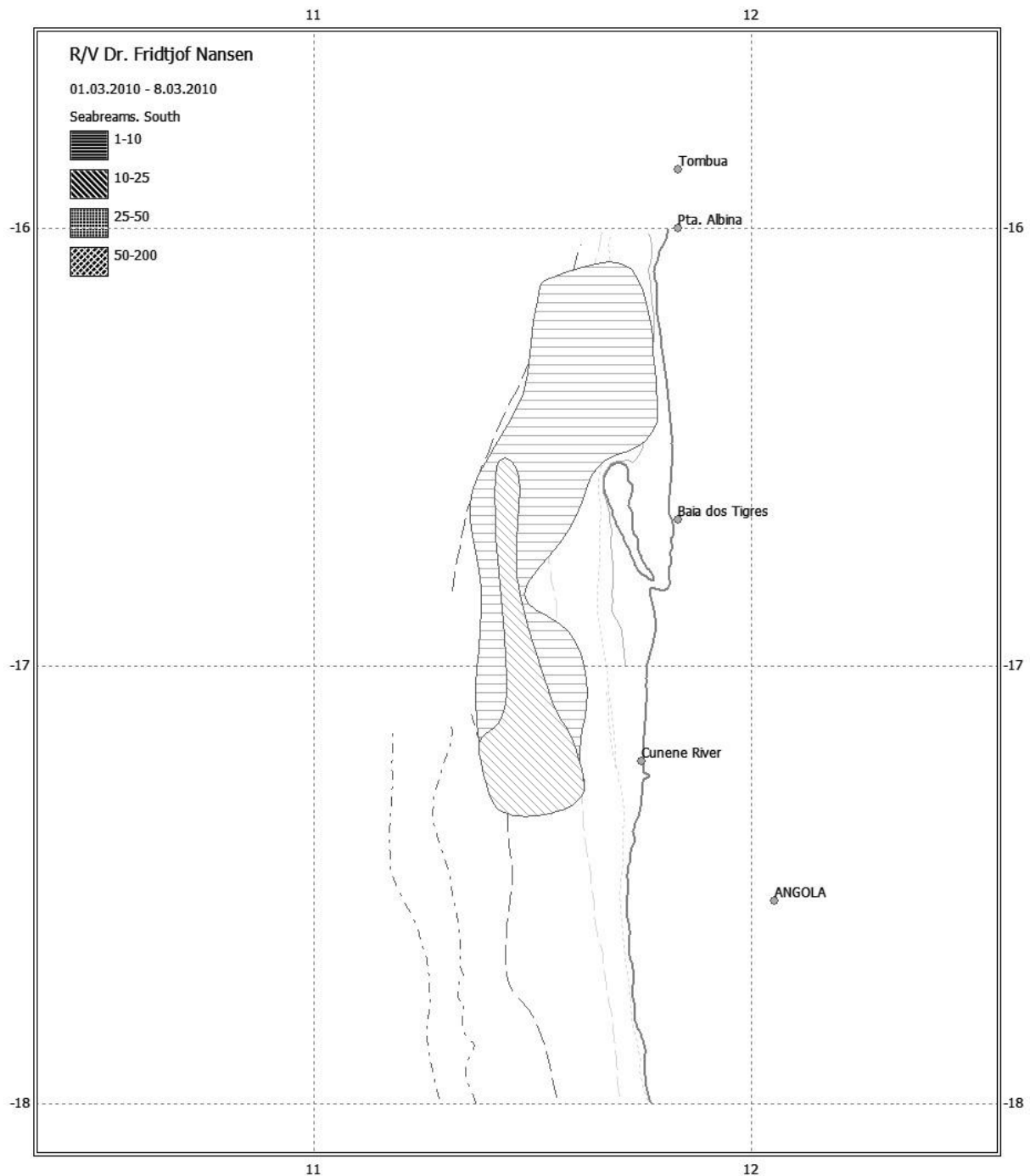
Survey	Hake	T.treace	Horsemackerel	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1986.1	1099 (0.5)	14235 (0.6)	23059 (0.5)	1188 (1.0)	618 (0.6)	51 (1.8)	23059 (0.5)	43 (1.0)
1986.2	3709 (0.8)	69542 (0.5)	78132 (0.5)	1555 (0.5)	2593 (0.9)	0	78165 (0.5)	173 (0.9)
1989.1	349 (0.9)	2883 (1.1)	15681 (0.9)	776 (0.6)	188 (0.9)	0	15681 (0.9)	60 (0.8)
1989.2	1121 (1.3)	979 (0.9)	13706 (0.7)	6114 (0.8)	12200 (1.4)	0	13706 (0.7)	35 (1.1)
1989.3	6740	11636	39225	2087	551	0	39225	155
1991.1	2920 (1.3)	21429 (0.6)	50458 (0.5)	732 (0.4)	4005 (1.5)	6 (1.7)	50459 (0.5)	106 (1.5)
1991.2	4385 (0.7)	25595 (0.6)	62961 (0.6)	2192 (1.7)	957 (0.5)	444 (1.6)	62961 (0.6)	0
1992	6756 (0.5)	8106 (0.9)	95433 (0.4)	745 (0.6)	2220 (0.6)	70 (1.5)	95436 (0.4)	0
1993	4023 (0.4)	52839 (0.9)	64235 (0.7)	2502 (0.8)	2278 (0.7)	8 (1.6)	64235 (0.7)	347 (1.0)
2000	3559 (0.8)	185345 (1.0)	218410 (0.9)	1934 (0.3)	2051 (0.5)	43 (1.8)	218473 (0.9)	28 (0.9)
2002	3779 (0.8)	116985 (1.3)	237050 (0.6)	1937 (1.0)	69 (0.9)	1217 (1.7)	237058 (0.6)	711 (1.8)
2003	7014 (0.6)	76533 (0.8)	113879 (0.7)	1630 (0.9)	1163 (1.2)	3601 (1.5)	114293 (0.7)	546 (1.8)
2004	11860 (0.6)	72982 (0.6)	237659 (0.8)	2547 (0.7)	348 (0.7)	12998 (1.8)	237659 (0.8)	6 (1.8)
2005	5067 (0.7)	114 (1.8)	129070 (0.5)	2309 (0.6)	1067 (0.4)	2410 (0.7)	129088 (0.5)	1 (1.8)
2006	3713 (0.4)	126892 (0.5)	184129 (0.5)	1545 (0.7)	3631 (1.4)	308909 (1.0)	184129 (0.5)	2221 (1.7)
2007	3006 (0.5)	100468 (0.5)	107896 (0.5)	1459 (0.5)	2016 (0.5)	1747 (0.8)	107918 (0.5)	95 (1.3)
2008	1722 (1.0)	169349 (0.6)	215814 (0.5)	3235 (0.6)	278 (1.1)	43 (1.3)	215814 (0.5)	1124 (0.8)
2009	31018 (0.3)	322270 (0.8)	322460 (0.8)	1017 (0.5)	271 (0.6)	2148 (1.8)	322460 (0.8)	50 (1.7)
2010	2495 (0.8)	76870 (0.7)	286228 (0.5)	1732 (0.7)	190 (1.0)	100656 (1.2)	286240 (0.5)	605 (1.1)

Survey	Hairtails	Croakers	Seabreams	Ommastrephidae	Sepiidae	D.macrophthalmus	D. angolensis	U. cariensis
1986.1	334 (0.9)	1560 (0.9)	9736 (0.3)	31 (0.6)	138 (0.9)	8304 (0.3)	81 (1.2)	135 (1.3)
1986.2	1694 (1.3)	3960 (1.0)	19201 (0.5)	0	726 (0.7)	17055 (0.5)	5 (1.7)	86 (1.5)
1989.1	965 (1.4)	1492 (0.6)	17853 (0.5)	61 (0.5)	159 (1.1)	17020 (0.5)	139 (1.6)	361 (1.0)
1989.2	510 (1.0)	3601 (0.9)	32669 (0.4)	7 (1.7)	0	31615 (0.4)	16 (1.7)	442 (0.8)
1989.3	1746	1443	15594	192	17	15509	27	86
1991.1	1335 (0.7)	1341 (0.5)	22333 (0.3)	25 (1.1)	20 (1.6)	20180 (0.4)	6 (1.7)	118 (0.9)
1991.2	255 (0.6)	567 (0.5)	22536 (0.4)	25 (0.9)	31 (1.0)	21994 (0.4)	7 (1.7)	102 (1.1)
1992	13 (1.4)	576 (0.9)	32666 (0.5)	428 (1.2)	148 (0.7)	31822 (0.6)	118 (1.7)	30 (1.0)
1993	361 (1.4)	2744 (0.6)	58399 (0.5)	145 (0.4)	126 (1.6)	57722 (0.5)	238 (1.6)	496 (0.9)
2000	1008 (1.5)	3623 (0.6)	61693 (1.0)	9 (1.7)	400 (0.5)	58637 (1.0)	63 (1.3)	306 (0.7)
2002	0	1046 (1.2)	24802 (1.0)	21 (1.7)	1043 (1.6)	23819 (1.0)	0	12 (1.7)
2003	48 (1.2)	1115 (0.4)	15856 (0.4)	397 (0.7)	53 (1.4)	13313 (0.4)	0	172 (0.8)
2004	2 (1.7)	518 (1.2)	26947 (0.7)	549 (0.9)	920 (1.5)	24702 (0.7)	1 (1.7)	8 (1.8)
2005	274 (1.5)	6164 (0.7)	12654 (0.5)	1655 (0.9)	63 (1.4)	12121 (0.5)	221 (1.7)	330 (1.2)
2006	26 (1.7)	924 (0.6)	11470 (0.3)	98 (0.9)	199 (0.9)	11058 (0.3)	0	229 (1.1)
2007	93 (1.2)	4168 (1.2)	15520 (0.4)	555 (1.0)	15 (1.7)	14579 (0.4)	70 (1.7)	563 (1.0)
2008	85 (0.7)	404 (0.9)	9147 (0.4)	6 (1.7)	504 (1.2)	7276 (0.4)	113 (1.7)	44 (0.9)
2009	27 (0.7)	695 (0.7)	9804 (0.5)	371 (0.9)	0 (1.7)	9619 (0.5)	1 (1.7)	118 (1.2)
2010	148 (1.4)	321 (0.9)	9218 (0.4)	46 (1.1)	0	8118 (0.4)	0	99 (1.5)

### Distribution

Figure 4.1a shows the distribution of seabreams in the southern survey area. A low concentration covered most of survey area shallower than 300 m, with denser concentrations in the central and southern part of this between Cunene River and Baía dos Tigres. The distribution was very similar to the one observed in 2009.



**Figure 4.1** Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100 and 200 m.



## 4.2 Benguela - Ponta das Palmerinhas shelf

The central region of Angolan waters covers from Benguela to Ponta das Palmerinhas. A total of 69 successful swept-area trawl stations were accomplished on the central shelf area (Table 2.1).

The average catch in the central region was 748 kg/hour on the inner shelf and 469 kg/hour on the outer shelf (Annex VI). The pelagic group was the most abundant on the inner shelf and contributed 41% to the overall catch. The 'demersal' group contributed to 37% of the mean catch rate whereas shrimps and sharks both contributed to less than 1% while cephalopods contributed 1.6 % of the total average catch rate on the inner shelf.

Demersal fish were more abundant than pelagic fish on the outer shelf contributing to 34% of the average catch rate, whilst the 'pelagic' group contributed to 16%. Like on the inner shelf, shrimps and sharks contributed to less than 1%, while cephalopods contributed 2.4 % of the total average catch. As last year seabreams (except *Boops boops*) were caught in most of the trawl stations on the inner shelf as well as in all stations on the outer shelf, and the average catch rates were 59 kg/hour on the inner and 72 kg/hour on the outer shelf. The most common seabreams on the inner shelf were *Pagellus bellottii* (71%) and *D. barnardi* (12%) while *D. angolensis* (41%), *P. bellottii* (32%) and *D. barnardi* (16%) were the most common seabreams on the outer shelf.

Snappers had low catch rates both on the inner and outer shelf with 0.7 kg/h and 0.3 kg/h respectively. Groupers were caught on the inner shelf with an average catch rate of 4.1 kg/hour. No catches were made on the outer shelf. Similar, the grunts (*Pomadysys* spp.) were caught on the inner shelf with the exception of the innermost stations and were only found in the shallower part of the outer shelf. The average catch rates were relatively high with 104 kg/hour on the inner and 12 kg/hour on the outer shelf. However particularly one station (#33) contributed to the catch rate outside of 70 m bottom depth. In both regions it was *P. peroteti* and *P. incisus* that dominated. Contribution from other species were negligible.

Croakers had average catch rates of 26 kg/h on the inner shelf and 14 kg/h on the outer shelf. Catches consisted mainly of *U. canariensis* (canary drum). The most common pelagic groups on the inner shelf were carangids, caught with an average catch rate of 231 kg/hour, clupeids with an average catch rate of 23 kg/hour and barracudas (*Sphyaena guachancho* and *S. sphyraena*) with an average catch rate 6 kg/hour. The average catch rates of the same species groups on the outer shelf were 10 kg/hour of carangids, <0.1 kg/hour of clupeids (from one station) while no barracudas were caught.

The hairtail (*Trichiurus lepturus*) was caught on the inner shelf with an average catch rate of 41 kg/hour, whereas on the outer shelf the average catch rate was 65 kg/hour.

### *Biomass estimates*

Table 4.2 shows the time series from 1985 to 2009 of swept-area biomass estimates for commercial species and groups of species on the shelf off central Angola. The biomass estimates were calculated by stratifying by depth (20-49, 50-99 and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of conducted trawls by strata and survey. It must be noted that the biomass estimates presented for the pelagic species may not reflect the true biomass trends, as pelagic species are often unavailable for the bottom trawl. Therefore, the biomass

estimates of the pelagic species may more reflect their availability to the trawl than the abundance. Some of the biomass estimates in Table 4.2 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

*T. trecae* was the only horse mackerel species found in the central and northern regions. The biomass on the central shelf has decreased dramatically from 2002 but with a slight indication of improvement in 2009 when the estimate was 10 000 tonnes. However, the 2010 estimate of 2000 tonnes is the lowest in the whole time series.

*M. polli* was the only hake species caught north of Benguela. The 2010 estimate of 22 tonnes was the same as in 2008 while the 2009 estimate of 4 tonnes was 80% lower than in 2008 and the second lowest in the time series.

Seabreams is the most important commercially demersal fish group in Angola. The survey biomass estimates for the central shelf have fluctuated greatly throughout the years. From 1991 to 2002, the total biomass was between 20 000 and 30 000 tonnes with a peak of 63 200 tonnes in 1998. The seabream biomass has declined since 1998 and was estimated to 5 800 tonnes in 2008, the second lowest in the time series. There was a small increase in 2009 that continued with the present estimate of 8 700 tonnes in 2010. This is still among the lowest biomass estimates in the time series.

The biomass estimate of croakers increased from 4 850 tonnes in 2006 to about 8 000 tonnes in 2007 which is the highest estimate since 1999, but decreased to 3 600 tonnes in 2008 and further to 2 100 tonnes in 2009. In 2010 the biomass was estimated to 2 700 tonnes. *Umbrina canariensis* is the most abundant croaker, and contributed to about 65% of the total croaker biomass.

The 2010 biomass estimate of grunts (*Pomadasyus incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 7 600 tonnes. This is a small increase from the 5 000 tonnes that was estimated in 2009 and the estimate of 5 900 tonnes in 2008. The estimates have been below 10 000 tonnes during the whole time series and the present estimate is the third highest since 2000.

Catches of snappers are infrequent and low as they inhabit rocky and often untrawlable (bottom trawl) areas. Hence the biomass estimates of snappers do not adequately reflect the state of the stock.

Groupers, mainly *Epinephelus aeneus*, are found on the inner shelf and are coastal rocky and sandy shore dwellers. The 2010 survey show an estimated biomass of 280 tonnes. The high CVs indicates that the biomass estimates of *E. aeneus* should be considered with care. There is no clear trend in the time series as the survey estimates vary largely between years.

The biomass estimate of *P. longirostris* (deep water rose shrimp) of 180 tonnes in 2010 was slightly lower than the 200 tonnes observed in 2009, which was almost the same as found in 2008 (230 tonnes). *P. longirostris* is mainly distributed in the deeper parts of the shelf and the slope.

In 2010 no (two tonnes) Sepiidae was found on the central shelf. The biomass estimate of Sepiidae was 124 tonnes in 2009, which is a large increase from the 2008 estimate of

38 tonnes. However, the annual variability and the high CVs may indicate that the estimates do not accurately reflect the state of the stock.

The biomass estimate of Ommastrephidae was 179 tonnes in 2010. This is a slight increase from the 100 tonnes observed in 2009, but lower than the 330 tonnes estimated in 2008. The annual variability and CVs are high also for this group.

**Table 4.2** Biomass estimates (tonnes) of important species on the shelf (20-200 m) in the central region. CV values are indicated in brackets.

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985	124 (0.93)	74892 (0.98)	58 (1.61)	5372 (0.77)	0	423 (1.33)	75408 (0.98)	0
1986	276 (1.02)	17875 (0.62)	1632 (0.92)	1439 (0.47)	228 (1.47)	717 (0.69)	20440 (0.54)	34 (1.29)
1986	207 (0.97)	22596 (0.79)	371 (1.12)	1423 (0.78)	0	328 (0.89)	24625 (0.72)	16 (1.61)
1989	121 (1.62)	6999 (0.41)	237 (1.05)	1864 (0.59)	148 (0.94)	560 (1.54)	12736 (0.49)	155 (0.67)
1989	1013 (0.80)	21473 (0.51)	677 (0.75)	2206 (0.33)	105 (1.06)	359 (0.94)	26453 (0.47)	95 (0.50)
1989	480 (1.10)	9579 (0.94)	453 (1.41)	2015 (0.79)	285 (1.29)	1707 (0.81)	12816 (0.90)	310 (1.21)
1991	0 (1.69)	86136 (0.77)	39 (1.11)	850 (0.31)	746 (1.00)	508 (0.94)	87396 (0.76)	277 (0.81)
1991	618 (1.20)	47927 (0.85)	125 (1.04)	2021 (0.50)	115 (1.69)	36 (1.61)	48814 (0.83)	126 (1.30)
1992	1641 (0.62)	32878 (0.46)	106 (1.13)	2597 (0.30)	483 (1.11)	70 (1.16)	35314 (0.46)	64 (0.89)
1994	2393 (1.35)	61886 (0.53)	292 (0.92)	2696 (0.41)	269 (0.83)	22 (0.96)	63569 (0.51)	580 (0.80)
1995	167 (0.77)	4875 (0.99)	323 (0.80)	807 (0.42)	121 (0.88)	245 (0.59)	12635 (0.51)	213 (1.06)
1996	713 (1.09)	51220 (0.77)	116 (0.98)	2402 (0.41)	496 (1.08)	589 (0.89)	55750 (0.71)	53 (1.77)
1997	4557 (1.20)	27729 (0.74)	1088 (0.94)	3268 (0.44)	208 (0.99)	3442 (1.89)	38605 (0.59)	46 (1.61)
1997	7635	68984	1391	2531	149	125	70873	279
1998	375 (1.45)	4630 (0.89)	365 (0.82)	2587 (0.34)	310 (0.96)	2860 (1.57)	7606 (0.64)	52 (1.35)
1999	15 (1.69)	12977 (0.53)	15 (0.74)	890 (0.38)	107 (1.15)	1961 (0.92)	20379 (0.43)	34 (1.28)
2000	240 (1.53)	19114 (0.49)	314 (0.91)	1744 (0.30)	560 (0.82)	1594 (0.90)	25052 (0.41)	275 (1.20)
2001	123 (1.15)	16510 (0.48)	212 (1.28)	1374 (1.06)	343 (0.78)	80 (1.01)	20942 (0.42)	97 (0.77)
2002	1189 (0.83)	78646 (0.41)	531 (0.74)	2930 (0.57)	120 (0.81)	1625 (0.64)	85797 (0.38)	745 (1.51)
2003	1774 (0.85)	25494 (0.54)	515 (0.70)	1327 (0.44)	266 (0.78)	1439 (0.64)	29369 (0.47)	55 (0.85)
2004	174 (1.53)	12263 (0.58)	974 (1.11)	1026 (0.34)	586 (0.85)	2193 (0.79)	15324 (0.47)	41 (1.03)
2005	44 (1.42)	7137 (0.52)	84 (0.71)	1427 (0.16)	201 (0.66)	1535 (0.84)	9357 (0.44)	216 (1.30)
2006	44 (1.07)	9622 (0.37)	188 (1.01)	1674 (0.27)	475 (0.72)	2275 (0.84)	13434 (0.35)	134 (0.69)
2007	55 (0.84)	7649 (0.49)	54 (0.59)	1822 (0.30)	802 (1.19)	2078 (0.67)	13485 (0.59)	18 (1.15)
2008	22 (1.17)	3703 (0.51)	257 (0.90)	1295 (0.22)	132 (0.68)	945 (1.10)	5636 (0.38)	17 (1.18)
2009	4 (1.51)	10073 (0.50)	195 (1.14)	1678 (0.37)	94 (0.90)	8854 (1.26)	14765 (0.44)	21 (1.57)
2010	22 (1.69)	2354 (0.57)	204 (0.84)	1628 (0.27)	157 (0.67)	1420 (1.46)	13526 (1.34)	79 (0.84)

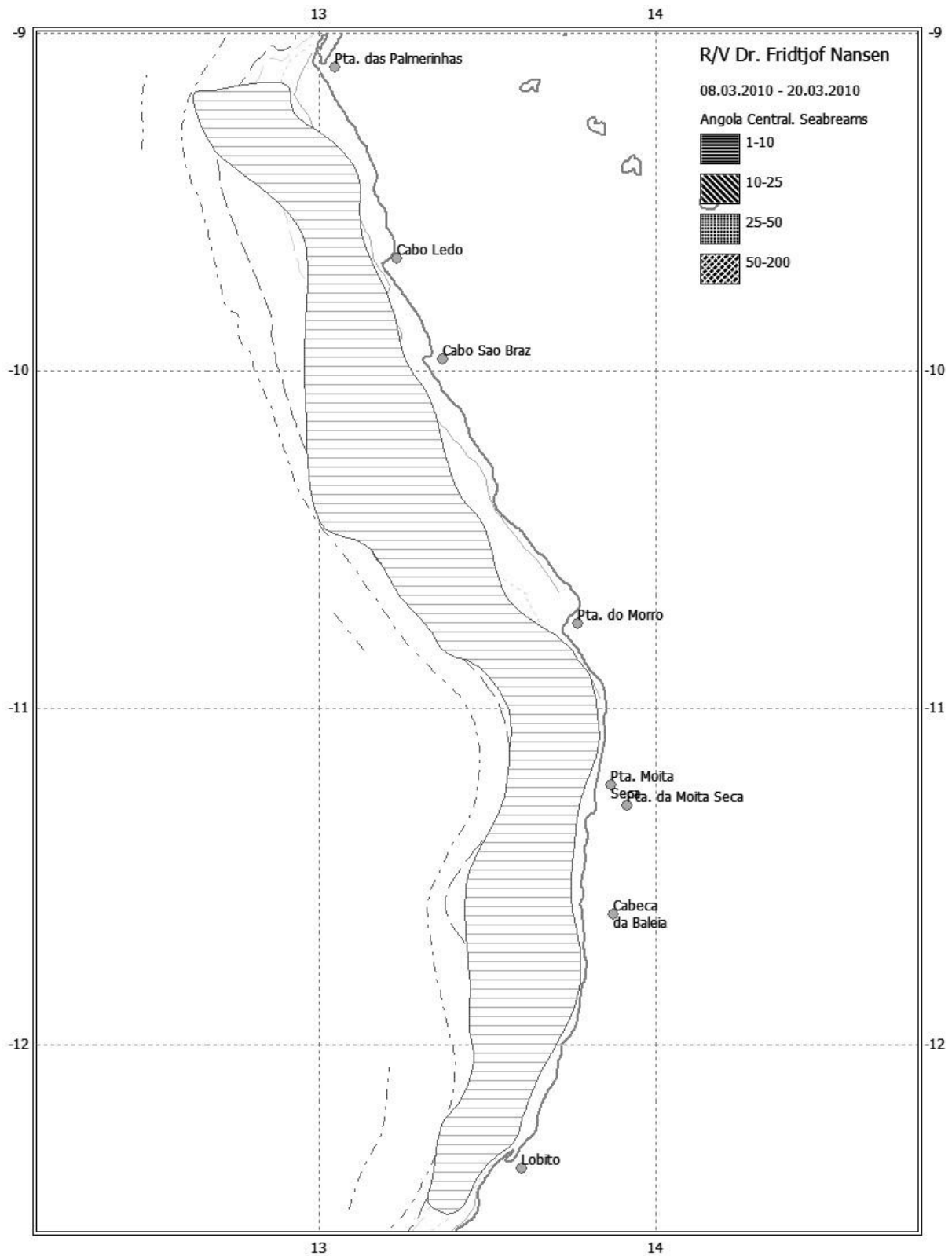
Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985	2568 (1.16)	253 (1.26)	0	1253 (0.95)	5706 (1.37)	10235 (1.45)	18407 (0.72)	58 (1.61)
1986	15125 (0.67)	1019 (0.62)	36 (1.96)	411 (0.81)	2237 (0.73)	4649 (0.50)	9161 (0.46)	1483 (1.01)
1986	1089 (0.70)	1117 (0.77)	0	518 (1.15)	5301 (0.66)	4510 (0.77)	13819 (0.46)	0
1989	9992 (0.60)	1936 (1.34)	0	580 (0.78)	3681 (1.02)	1395 (0.72)	11443 (0.48)	235 (1.05)
1989	2128 (0.80)	701 (0.60)	20 (1.96)	3093 (1.55)	1126 (0.92)	2972 (0.72)	12167 (0.36)	667 (0.76)
1989	8488 (1.45)	704 (0.74)	0	660 (1.62)	82 (1.18)	595 (1.38)	4531 (0.56)	445 (1.43)
1991	7664 (0.72)	583 (0.72)	106 (1.96)	176 (1.12)	425 (0.51)	2048 (0.85)	9068 (0.31)	10 (1.19)
1991	3174 (0.45)	82 (0.85)	0	1021 (0.93)	1882 (0.87)	20081 (1.33)	25675 (0.36)	117 (1.11)
1992	11105 (0.58)	89 (1.29)	0	1140 (0.88)	765 (1.13)	1546 (0.70)	25033 (0.44)	106 (1.13)
1994	24185 (1.44)	4 (1.96)	262 (1.96)	417 (0.62)	68 (0.81)	10292 (0.99)	29548 (0.37)	168 (0.70)
1995	3885 (0.43)	2113 (0.65)	113 (1.96)	376 (0.77)	3105 (1.12)	15510 (1.05)	14161 (0.47)	258 (0.95)
1996	3443 (0.44)	946 (0.87)	109 (1.96)	690 (0.81)	3095 (0.65)	5866 (0.51)	18323 (0.27)	25 (1.34)
1997	21454 (0.60)	496 (1.80)	0	233 (1.10)	1592 (1.54)	9033 (0.60)	21952 (0.58)	1087 (0.94)
1997	13839	0	0	1023	293	7099	31763	1265
1998	29020 (1.52)	454 (0.82)	0	198 (1.24)	9117 (0.82)	8609 (0.86)	63225 (1.22)	186 (0.84)
1999	8210 (0.66)	1605 (0.53)	526 (1.86)	631 (0.77)	3289 (0.87)	9891 (0.90)	17435 (0.39)	9 (0.93)
2000	11002 (0.41)	3321 (0.58)	98 (1.50)	882 (0.87)	6824 (0.51)	5391 (0.44)	19310 (0.31)	290 (0.98)
2001	5595 (0.54)	957 (0.41)	3 (1.96)	64 (1.08)	1329 (0.60)	1744 (0.70)	12617 (0.53)	198 (1.36)
2002	8190 (0.45)	667 (0.63)	0 (1.96)	233 (1.01)	2982 (0.57)	6334 (0.42)	22198 (0.61)	402 (0.88)
2003	12067 (0.52)	480 (0.61)	44 (1.96)	702 (0.73)	8649 (1.12)	5369 (0.41)	5595 (0.33)	449 (0.80)
2004	12405 (1.01)	401 (0.85)	42 (1.96)	175 (0.99)	3494 (0.95)	6602 (1.08)	9583 (0.55)	969 (1.11)
2005	31672 (0.84)	258 (0.75)	6 (1.96)	608 (0.84)	5980 (0.77)	5530 (0.55)	7752 (0.31)	50 (0.87)
2006	6453 (0.49)	991 (0.93)	35 (1.96)	446 (0.81)	4082 (0.85)	4850 (0.58)	11187 (0.31)	178 (1.07)
2007	22472 (0.91)	749 (0.46)	31 (1.73)	491 (0.99)	9275 (0.86)	8081 (1.07)	8013 (0.36)	36 (0.79)
2008	5098 (0.63)	1224 (1.26)	11 (1.96)	151 (0.78)	5926 (0.93)	3668 (0.72)	5763 (0.32)	233 (0.98)
2009	20812 (0.85)	152 (0.93)	124 (1.96)	192 (0.58)	4983 (0.59)	2104 (0.56)	7443 (0.31)	195 (1.15)
2010	7315 (0.40)	350 (0.83)	69 (0.70)	284 (0.82)	7676 (0.65)	2661 (0.56)	8732 (0.27)	183 (0.93)

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis	B.auritus
1985	0	0	6123 (1.31)	2697 (0.31)	6271 (1.83)	5065 (1.03)
1986	273 (1.68)	525 (0.64)	220 (1.25)	1314 (1.16)	2327 (0.86)	38045 (0.49)
1986	0	1132 (1.00)	1268 (1.46)	4010 (0.39)	2018 (1.15)	21342 (0.56)
1989	1236 (0.86)	65 (0.93)	6498 (0.66)	956 (0.48)	885 (0.88)	15038 (0.75)
1989	750 (0.51)	1168 (0.41)	1115 (0.93)	3628 (0.48)	1130 (0.82)	50016 (0.80)
1989	1476 (0.98)	124 (1.12)	1530 (1.50)	1667 (0.52)	0	37091 (0.51)
1991	344 (0.63)	235 (0.46)	2210 (0.88)	1212 (0.40)	1160 (1.44)	19833 (0.57)
1991	693 (0.71)	561 (1.00)	17098 (0.54)	956 (0.39)	18422 (1.45)	1862 (0.86)
1992	2163 (0.35)	159 (1.16)	18182 (0.58)	1514 (0.32)	1023 (0.98)	27200 (1.32)
1994	1041 (0.57)	1192 (0.70)	20365 (0.52)	2383 (0.45)	3280 (1.27)	2633 (1.10)
1995	2 (1.69)	385 (0.70)	7719 (0.81)	1877 (0.79)	11538 (1.16)	27645 (0.57)
1996	210 (0.52)	28 (1.32)	11195 (0.43)	1546 (0.43)	1077 (0.96)	18842 (0.70)
1997	1324 (0.47)	1323 (0.94)	12220 (1.03)	1497 (0.37)	4599 (0.60)	6964 (0.85)
1997	418	1251	24404	1260	4995	1953
1998	376 (0.65)	1295 (0.58)	50924 (1.50)	1990 (0.38)	2239 (0.77)	22014 (0.95)
1999	201 (1.28)	113 (0.64)	5178 (0.79)	1163 (0.40)	7999 (1.08)	93522 (0.61)
2000	586 (0.61)	418 (0.71)	6060 (0.76)	1639 (0.59)	2499 (0.51)	56245 (0.84)
2001	186 (0.96)	178 (0.83)	5680 (0.72)	1670 (0.44)	1076 (1.04)	41122 (0.69)
2002	2363 (0.70)	173 (0.91)	11512 (1.16)	923 (0.47)	3492 (0.54)	66053 (0.75)
2003	230 (0.58)	101 (0.82)	557 (0.66)	1046 (0.50)	1001 (0.51)	38312 (0.49)
2004	310 (0.89)	206 (0.65)	3525 (1.27)	1015 (0.41)	5700 (1.21)	26743 (0.42)
2005	233 (0.61)	565 (0.27)	879 (0.59)	991 (0.39)	2279 (0.64)	36621 (0.77)
2006	128 (0.54)	123 (1.00)	2802 (0.42)	1982 (0.39)	4329 (0.65)	33546 (0.86)
2007	43 (0.53)	245 (1.53)	1532 (0.86)	1312 (0.64)	5224 (1.39)	40402 (0.53)
2008	327 (0.46)	38 (1.07)	1496 (0.87)	1135 (0.34)	1801 (0.97)	17736 (0.40)
2009	110 (0.82)	124 (1.41)	699 (0.62)	1756 (0.56)	1419 (0.53)	22188 (0.83)
2010	179 (0.63)	2 (0.91)	572 (0.80)	2250 (0.40)	1097 (0.80)	8156 (0.66)

## Distribution

Figure 4.2 shows the distribution of seabreams in the central region between Benguela and Luanda. The distribution was spread out over the whole central shelf.



**Figure 4.2** Distribution of seabreams (Sparidae) in the central region, Benguela – Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

### 4.3 Ponta das Palmerinhas – Congo River shelf

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to Congo River. The area north of Congo River is inaccessible to fisheries surveys due to the restricted oil exploitation areas. During some of the previous surveys the area north of Congo River was covered, but to make plausible comparisons the biomass estimates in Table 4.3 only include trawl stations south of Congo River. A total of 58 successful swept-area trawl stations were accomplished on the shelf area in 2010 (Table 2.1).

The average catch per hour on the inner shelf was 452 kg/hour compared to 841 kg/hour last year while on the outer shelf the catch rates were 423 kg/hour compared with 242 kg/hour in 2009. (Annex VI). The ‘demersal’ group dominated on the inner shelf with an average catch rate of 192 kg/hour and a relative contribution of 42%. The ‘pelagic’ group contributed 27%, while shrimps, cephalopods and sharks contributed to less than 2% altogether. On the outer shelf, the demersal fish contributed to 54% of the mean catch rate and the ‘pelagic’ group to 16%. Shrimps, sharks and Cephalopods contributed to less than 3% altogether. Seabreams (except *B. boops*) had a mean catch rate of 32 kg/h (7% of the total) on the inner shelf. On the outer shelf catch rates were 72 kg/h (17% of the total). The most dominant seabream on the shelf was *D. angolensis*. Snappers were neither caught on the inner or the outer part of the shelf this year. The catch rates of groupers were 2.3 kg/hour on the inner and 1.9 kg/hour on outer shelf, respectively. The grunts (*Pomadasys incisus* and *P. rogeri*) were caught more often on the inner shelf than on the outer shelf. The average catch rate of grunts on the inner shelf was 40 kg/hour while 2.4 kg/hour on the outer shelf. Croakers, mainly *U. canariensis*, were relatively frequent on the shelf and the average catch rates were 26 kg/hour on the inner shelf and 31 kg/hour on outer shelf. The most common pelagic groups caught on the inner shelf were carangids, 40 kg/hour, clupeids, 32 kg/hour, hairtails, 17 kg/h, and barracudas, 16 kg/hour. Scombrids were not common in the catches (1 kg/hour). On the outer shelf carangids were still the most important group with 35 kg/hour, hairtails had catches of 17 kg/hour while other pelagic groups were not important.

#### *Biomass estimates*

Table 4.3 shows swept-area biomass estimates from 1985 to 2010 for the commercial species and groups of species on the shelf off northern Angola. The biomass estimates were calculated by stratifying by depth (20-49m, 50-99m and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. Again, it must be noted that the biomass estimates presented for the pelagic species cannot be trusted as a good reflection of the true biomass as the species are often unavailable to the bottom trawl. Some of the biomass estimates in Table 4.3 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The biomass estimate of *T. trecae* was 2 000 tonnes in 2010 and was matching the estimate in 2008 which was the lowest in the time series since 1996. In 2009 an estimated biomass of 4 400 tonnes was recorded. The highest estimate of 37 000 tonnes was registered in 1997 while the estimates generally has been below 10 000 the last 10 years.

24 tonnes of *M. polli* was estimated on the northern shelf in 2010. In 2009 and 2008 this species was not caught, while in 2007 the biomass was estimated to 37 tonnes.

The biomass estimate of seabreams on the northern shelf was 12 700 tonnes in 2010. This is a small increase from the 10 000 tonnes estimated in 2009 and similar to the 2008 and 2007 estimate. and considerably lower compared to the very high 2005 estimate of 18 300 tonnes which was the highest estimate since 1996. As in the previous years, *Dentex angolensis* was the dominated seabream species in the north.

The biomass estimate of croakers was 5 500 tonnes in 2010. The estimate is in between the 2009 estimate of 4000 tonnes and the 2008 estimate of 8 800 tonnes. *U. canariensis* dominates the croakers and in 2010 this species contributed to 61% of the total estimate of this group.

The biomass estimate of grunts (*Pomadasyus incisus*, *P. jubelini* and *P. peroteti*) was 3 200 tonnes in 2010, which was the same as in 2009 and similar level to what has been observed in previous years, although considerably lower than the relatively large estimate of 8000 tonnes in 2007.

The snappers are rare in the catch as they inhabit rocky and often unavailable areas, hence the biomass estimates of snappers may not adequately reflect the state of the stock. No snappers were caught in the northern region this year.

As in the previous years, groupers, mainly *Epinephelus aeneus*, are found on the outer shelf in very low abundance. The biomass estimates since 2000 have been fluctuating around 500 tonnes. This year 360 tonnes was estimated.

The biomass estimate on the northern shelf of *P. longirostris* in 2010 was the highest in the time series with 540 tonnes. The biomass estimates of this species on the shelf this year must however be seen in connection with decreased biomass in deeper waters and it seems that some of the biomass has been found in more shallow waters than what is usually the case.

The 2010 biomass estimate of Sepiidae was 200 tonnes. The biomass of these species on the northern shelf is generally relatively low with large fluctuations from year to year.

The biomass estimate of Ommastrephidae decreased from 230 tonnes in 2008 to 160 tonnes in 2009 and further this year to 120 tonnes. The 2007 estimate of 40 tonnes was the lowest estimate of the time series since 1989. The annual biomass estimates vary and no clear trend in the abundance of Ommastrephidae can be seen in Table 4.3

The biomass estimate of the sharks in 2010 was 291 tonnes. It has generally been a declining trend in the biomass of sharks on the northern shelf of Angola the last five years, and the biomass estimate is considerably lower than the high of 3 300 tonnes in 2000.



**Table 4.3** Biomass estimates (tonnes) of important species on the shelf (20-200 m) in the northern region. CV values are indicated in brackets.

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	9 (1.65)	4,496 (1.11)	302 (0.79)	10,463 (1.25)	498 (0.93)	364 (1.16)	9,986 (0.92)	44 (1.96)
1985.2	0	3,324 (1.17)	139 (1.88)	694 (0.57)	451 (0.64)	3,907 (1.91)	3,740 (1.04)	30 (1.64)
1985.3	3,459 (1.65)	16,486 (1.20)	1,448 (1.38)	2,046 (0.67)	870 (1.23)	205 (1.94)	17,742 (1.09)	146 (1.30)
1985.4	7,415 (1.65)	36,044 (1.14)	107 (1.37)	436 (0.72)	78 (1.55)	483 (1.15)	42,506 (1.02)	88 (1.26)
1986.1	56 (1.64)	13,438 (0.81)	1,445 (0.90)	2,853 (0.87)	496 (0.76)	2,053 (0.73)	17,950 (0.62)	30 (1.96)
1986.2	290 (1.21)	8,053 (0.37)	486 (0.72)	1,179 (0.38)	825 (0.56)	1,365 (0.67)	10,364 (0.32)	210 (0.97)
1989.1	62 (1.46)	12,681 (0.90)	92 (1.08)	931 (0.53)	497 (0.97)	1,578 (1.87)	13,264 (0.86)	97 (1.18)
1989.2	250 (1.65)	11,535 (0.66)	509 (0.61)	549 (0.38)	729 (0.85)	1,924 (0.53)	13,966 (0.57)	220 (0.98)
1989.3	1,029 (1.62)	39,959 (0.58)	256 (1.04)	1,715 (0.90)	15,984 (1.10)	5,043 (0.73)	46,704 (0.59)	208 (0.59)
1991.1	0	21,484 (0.57)	381 (1.69)	935 (0.37)	705 (0.67)	1,841 (0.96)	43,605 (0.68)	96 (1.36)
1991.2	312 (1.14)	14,727 (0.71)	2,554 (1.79)	4,225 (0.60)	107 (0.82)	55 (0.78)	14,928 (0.70)	318 (0.74)
1992	1,304 (1.04)	15,520 (0.65)	79 (1.19)	3,114 (0.38)	298 (1.10)	8 (1.96)	17,942 (0.59)	158 (0.87)
1994	51 (1.21)	14,309 (0.81)	478 (1.40)	3,643 (0.48)	52 (1.09)	184 (1.96)	21,225 (0.62)	337 (0.87)
1995.1	127 (1.17)	305 (0.80)	951 (0.98)	451 (0.40)	679 (0.64)	1,369 (0.79)	7,078 (0.69)	181 (0.81)
1996	0	32,155 (0.54)	347 (0.64)	2,203 (0.33)	256 (0.67)	782 (1.62)	33,700 (0.51)	137 (1.14)
1997.1	25 (1.50)	37,094 (0.51)	474 (0.89)	6,218 (0.50)	758 (0.67)	6,391 (1.14)	130,055 (0.87)	288 (1.18)
1999	6 (1.17)	4,106 (0.47)	326 (0.96)	1,202 (0.35)	1,297 (0.54)	6,392 (0.60)	16,570 (0.54)	36 (1.65)
2000	12 (1.65)	6,583 (0.56)	150 (0.92)	609 (0.65)	3,302 (1.70)	619 (1.54)	22,483 (0.88)	69 (1.20)
2001	6 (1.65)	5,502 (0.87)	212 (0.80)	866 (0.88)	391 (0.74)	517 (0.71)	9,560 (0.71)	37 (0.93)
2002	0	9,765 (0.52)	52 (0.52)	956 (0.51)	178 (0.64)	1,442 (0.57)	13,125 (0.41)	75 (0.61)
2003	0	9,995 (0.54)	501 (0.80)	501 (0.57)	250 (0.51)	2,816 (0.60)	28,515 (0.94)	81 (1.64)
2004	0 (1.65)	9,146 (0.49)	196 (1.14)	1,059 (0.26)	492 (0.44)	1,567 (0.70)	12,764 (0.42)	22 (1.00)
2005	0	3,792 (0.52)	146 (0.66)	1,674 (0.31)	734 (0.31)	599 (0.79)	10,292 (0.63)	116 (1.11)
2006	0	5,078 (0.42)	320 (0.99)	1,024 (0.33)	556 (0.84)	2,388 (0.90)	11,445 (0.37)	50 (0.86)
2007	37 (1.63)	2,983 (0.38)	243 (0.71)	703 (0.26)	432 (0.47)	1,797 (0.64)	9,442 (0.47)	195 (0.93)
2008	0	1,938 (0.49)	331 (1.25)	1,204 (0.37)	464 (0.45)	1,754 (0.88)	17,154 (0.71)	151 (0.80)
2009	0	4,412 (0.36)	108 (0.86)	1,010 (0.27)	381 (0.80)	2,961 (1.27)	9,792 (0.73)	100 (0.88)
2010	24 (1.65)	1,986 (0.60)	578 (1.23)	888 (0.36)	291 (0.44)	1,818 (1.69)	6,445 (0.39)	84 (1.09)

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15,711 (0.87)	254 (0.90)	0	479 (1.09)	248 (1.02)	1,519 (1.00)	14,690 (0.57)	117 (1.38)
1985.2	1,200 (1.65)	75 (0.81)	63 (1.26)	1,771 (0.78)	381 (1.31)	1,302 (1.10)	12,881 (0.34)	0
1985.3	2,709 (0.73)	26 (1.65)	62 (1.96)	1,978 (0.84)	3,629 (0.94)	8,695 (0.94)	20,897 (0.67)	0
1985.4	3,608 (0.70)	780 (1.46)	0	3,054 (0.63)	14,806 (1.14)	3,692 (0.93)	31,078 (0.45)	10 (1.65)
1986.1	8,078 (1.11)	2,080 (0.67)	434 (1.96)	676 (0.80)	1,231 (0.98)	2,307 (0.97)	17,193 (0.40)	521 (1.09)
1986.2	8,640 (0.82)	756 (0.51)	0	1,515 (0.51)	1,694 (0.59)	5,049 (0.37)	25,098 (0.28)	0
1989.1	2,277 (0.71)	345 (0.80)	0	989 (1.17)	135 (0.96)	4,469 (0.88)	12,958 (0.37)	60 (1.29)
1989.2	3,712 (0.46)	2,973 (0.89)	33 (1.64)	841 (0.68)	1,102 (0.72)	3,231 (0.34)	7,283 (0.34)	22 (0.90)
1989.3	21,132 (1.13)	364 (1.02)	316 (1.96)	315 (0.73)	1,788 (0.86)	4,214 (0.70)	15,344 (0.58)	31 (1.50)
1991.1	11,448 (0.88)	2,739 (1.40)	0	642 (0.92)	822 (0.85)	3,797 (0.83)	4,769 (0.23)	0
1991.2	4,949 (0.57)	79 (1.27)	0	1,022 (0.69)	860 (1.21)	6,450 (0.93)	15,741 (0.39)	129 (0.94)
1992	4,588 (0.47)	14 (1.29)	0	1,844 (0.80)	932 (0.90)	2,778 (0.59)	14,551 (0.22)	49 (1.65)
1994	4,423 (0.45)	325 (1.03)	0	2,474 (0.75)	612 (0.83)	4,095 (0.80)	19,599 (0.47)	478 (1.40)
1995.1	7,208 (0.58)	2,109 (1.10)	481 (1.50)	807 (0.70)	2,921 (1.08)	2,882 (0.73)	8,341 (0.30)	477 (1.13)
1996	3,939 (0.43)	89 (1.35)	0	2,002 (0.97)	5,161 (0.90)	9,292 (0.49)	19,985 (0.68)	10 (1.60)
1997.1	6,323 (0.41)	57 (1.70)	73 (1.96)	549 (0.76)	4,836 (1.05)	12,451 (0.53)	9,009 (0.28)	124 (1.38)
1999	14,001 (0.39)	2,712 (0.70)	5 (1.64)	1,011 (0.60)	5,600 (0.80)	8,528 (0.91)	13,304 (0.25)	113 (0.79)
2000	4,216 (0.75)	1,231 (1.37)	196 (1.64)	620 (0.48)	388 (0.98)	2,450 (0.66)	13,424 (0.35)	18 (0.91)
2001	17,036 (0.94)	856 (0.86)	723 (1.91)	793 (0.97)	2,271 (1.04)	1,458 (0.80)	8,927 (0.40)	101 (0.86)
2002	19,374 (0.60)	1,651 (0.78)	63 (1.96)	509 (0.88)	241 (0.54)	2,835 (0.53)	9,187 (0.35)	21 (1.00)
2003	6,818 (0.56)	2,345 (1.34)	142 (1.96)	340 (0.68)	1,376 (0.60)	5,571 (0.52)	9,889 (0.29)	65 (1.42)
2004	4,668 (0.47)	1,455 (1.15)	37 (1.87)	502 (0.63)	3,316 (0.86)	5,545 (0.74)	11,924 (0.28)	6 (1.28)
2005	5,632 (0.54)	705 (1.35)	278 (1.27)	568 (0.40)	5,754 (0.96)	7,949 (0.59)	18,282 (0.25)	5 (0.87)
2006	11,299 (0.39)	1,570 (0.61)	16 (1.82)	372 (0.71)	2,839 (0.77)	4,087 (0.57)	10,872 (0.25)	176 (1.42)
2007	9,102 (0.58)	1,587 (1.16)	83 (1.35)	460 (0.47)	7,966 (1.40)	3,901 (0.58)	12,758 (0.25)	135 (1.21)
2008	10,986 (0.53)	428 (0.51)	79 (1.96)	614 (0.54)	1,485 (0.69)	8,771 (0.67)	12,833 (0.28)	40 (0.89)
2009	7,272 (0.64)	1,591 (0.87)	168 (1.34)	586 (0.55)	3,209 (0.92)	3,936 (0.59)	9,974 (0.36)	84 (1.07)
2010	2,921 (0.46)	852 (0.95)	0	358 (0.66)	3,194 (0.83)	5,454 (0.63)	12,656 (0.24)	537 (1.31)

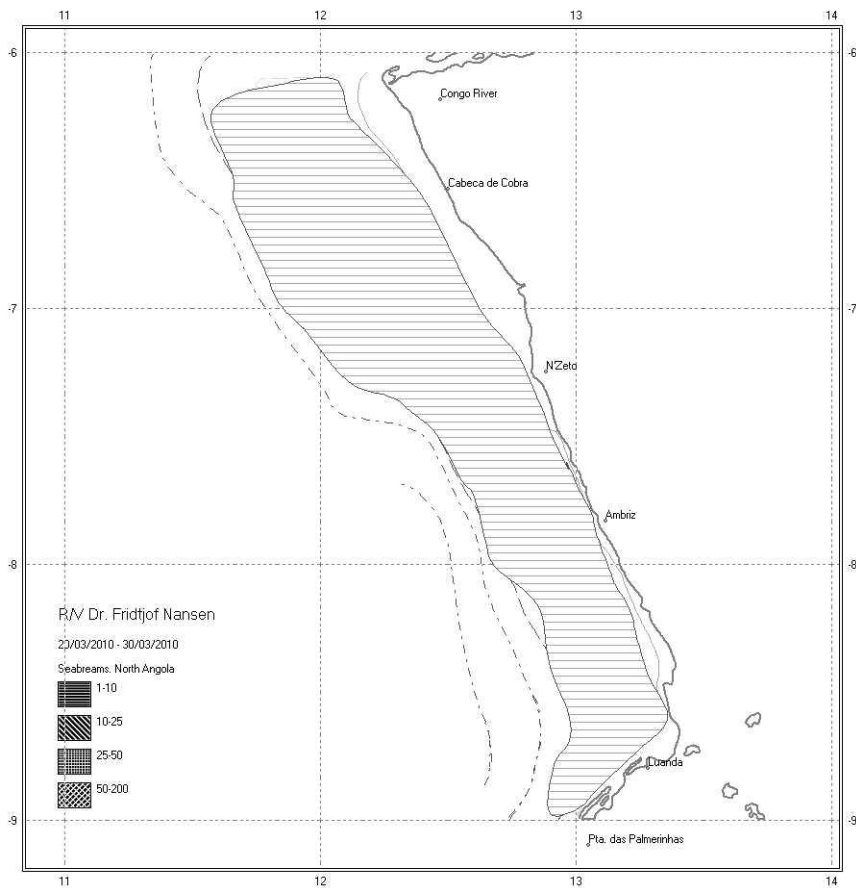
  

Survey	Ommastrephidae	Sepiidae	macrophthalmi	D.angolensis	U.canariensis	B.auritus
1985.1	10,273 (1.27)	0	200 (1.65)	2,196 (0.55)	1,132 (1.21)	40,729 (1.15)
1985.2	0	0	0	2,495 (0.57)	521 (1.46)	6,842 (1.40)
1985.3	0	154 (0.97)	0	2,949 (0.69)	602 (1.14)	9,182 (1.20)
1985.4	84 (1.34)	215 (1.28)	125 (1.64)	6,371 (0.97)	2,650 (0.95)	64,007 (1.08)
1986.1	1,531 (1.23)	808 (0.72)	2,058 (0.56)	3,814 (0.54)	279 (0.74)	95,679 (0.32)
1986.2	0	696 (0.60)	1,483 (0.48)	11,220 (0.35)	1,350 (0.48)	15,408 (0.45)
1989.1	506 (0.85)	288 (0.93)	0	1,612 (0.34)	542 (0.80)	5,450 (0.97)
1989.2	161 (0.53)	272 (0.72)	222 (0.87)	2,299 (0.57)	172 (0.54)	14,252 (0.46)
1989.3	1,661 (0.93)	45 (1.08)	100 (0.95)	2,614 (0.46)	1,194 (1.37)	51,225 (0.66)
1991.1	368 (0.53)	282 (0.76)	158 (1.06)	1,317 (0.37)	496 (0.72)	28,701 (0.70)
1991.2	2,718 (0.88)	226 (0.74)	690 (0.95)	3,198 (0.41)	4,375 (1.32)	1,661 (1.75)
1992	1,071 (0.40)	901 (0.64)	1,532 (1.10)	5,112 (0.26)	680 (0.65)	7,599 (1.38)
1994	441 (0.35)	1,910 (0.45)	1,740 (0.78)	3,451 (0.37)	2,740 (1.13)	7,572 (1.14)
1995.1	72 (0.58)	236 (0.48)	197 (1.11)	2,143 (0.38)	342 (1.15)	12,801 (0.74)
1996	589 (0.27)	106 (1.19)	2,169 (0.80)	4,303 (0.40)	2,073 (1.15)	26,804 (1.21)
1997.1	1,017 (0.71)	4,468 (0.68)	324 (0.78)	2,837 (0.41)	1,161 (0.79)	39,107 (0.51)
1999	391 (0.45)	254 (0.55)	146 (0.76)	2,881 (0.19)	3,582 (1.45)	37,727 (0.43)
2000	214 (0.83)	46 (0.66)	65 (0.86)	4,053 (0.77)	1,271 (1.08)	23,205 (0.70)
2001	176 (0.51)	196 (0.63)	417 (0.85)	1,228 (0.39)	188 (1.36)	13,842 (0.59)
2002	660 (0.72)	75 (0.59)	102 (1.18)	2,089 (0.52)	835 (0.83)	15,791 (0.65)
2003	121 (0.80)	206 (1.37)	16 (0.80)	3,201 (0.27)	769 (0.67)	66,412 (0.88)
2004	344 (0.42)	185 (0.83)	79 (1.12)	5,214 (0.39)	1,236 (0.53)	24,512 (1.00)
2005	146 (0.33)	427 (0.51)	136 (0.84)	6,727 (0.17)	3,640 (0.76)	52,045 (1.02)
2006	174 (0.77)	94 (0.61)	7 (1.34)	4,630 (0.20)	2,151 (0.93)	61,138 (0.66)
2007	42 (0.57)	190 (0.70)	11 (1.38)	5,980 (0.24)	622 (0.73)	12,523 (0.61)
2008	226 (0.50)	268 (0.87)	0	4,809 (0.28)	3,171 (0.64)	52,481 (0.95)
2009	163 (0.41)	98 (0.83)	8 (1.31)	4,418 (0.28)	985 (0.57)	23,822 (1.20)
2010	124 (0.42)	206 (1.08)	18 (1.11)	6,925 (0.24)	3,339 (0.87)	16,619 (0.73)

**Distribution**

Seabreams were distributed on the whole northern shelf (Figure 4.3). The densities were <10 tonnes/NM<sup>2</sup> along most of the area of distribution.





**Figure 4.3** Distribution of seabreams (Sparidae) in the northern region, Ponta das Palmerinhas -Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

## CHAPTER 5 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEEP-WATER SHRIMP AND HAKE ON THE SLOPE

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The slope is defined in the report, to be between 201 and 800 m bottom depth. The trawl positions are mapped in Figures 2.1-2.3, station information and catch by species are presented in Annex I.

Pooled length distributions weighted by the catch of the main species by sector region are shown in Annex II. Further, the mean densities (tonnes·NM<sup>-2</sup>) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various Nansis species codes used for species and groups of species, and Annex VI presents the catch rates of these species and species groups.

### 5.1 Cunene – Tombua slope

The slope is very steep and rocky in the south and makes trawling difficult. Five trawl stations were carried on the southern slope in depths between 200 and 800 meters (Annex VI). The average catch per hour was 1 109 kg/h which was only half of the biomass found in this region last year (2 457 kg/hour). The ‘demersal’ groups contributed 11% while ‘pelagic’ groups contributed 8%. The “other” group (non-commercial species) dominated the catches and contributed to 74% to the mean catch rate. Shrimps contributed with 4% while cephalopods and sharks contributed with 1% and 2% of catches respectively. Seabreams were not caught in the slope area. Cape hake (mainly *Merluccius capensis*) was caught at four stations with an average catch rate of 120 kg/hour. Striped red shrimps (*Aristeus varidens*) were found at all five of the stations and the mean catch was 18kg/h considerably less than the catch rates of 79 kg/hour found last year.

Table 5.1 shows the time series from 1986 to 2010 of the swept-area biomass estimates for different species and species groups on the southern slope. The numbers of trawl stations on the southern slope were very low due to the difficult trawling conditions caused by untrawlable sea bed. Therefore, no stratifying depth was done for the data. Further, only stations in the depth range 200-600 m were included in the biomass estimates, and in 2010 as in previous years, just two stations were carried out between 200 and 600 meters. The biomass estimates were therefore not reliable.

The biomass estimates of hake have fluctuated over the whole time series (Table 5.1). The 2010 estimate of 2336 tonnes was similar but slightly lower than the one observed in 2009 and almost 2.5 and 1.5 times higher than those of 2008 and 2007, respectively. The lack of any clear trend in the time series was probably caused by the low sampling effort on the southern slope between 200 and 600 meters. The contribution of the two hake species (*M. capensis* and *M. polli*) has varied through the years, and it was reasonable to believe that, in some surveys, a misidentification of the hakes could have happened. In the more recent surveys, more precautions have been taken when identifying to avoid misidentification of the two species. As last year the two stations between 200 and 600 m caught only *M. capensis* which therefore made up the whole biomass estimate of 2 750 tonnes. However hake of both

species were also found deeper than 600 m these stations were not included in the biomass estimate.

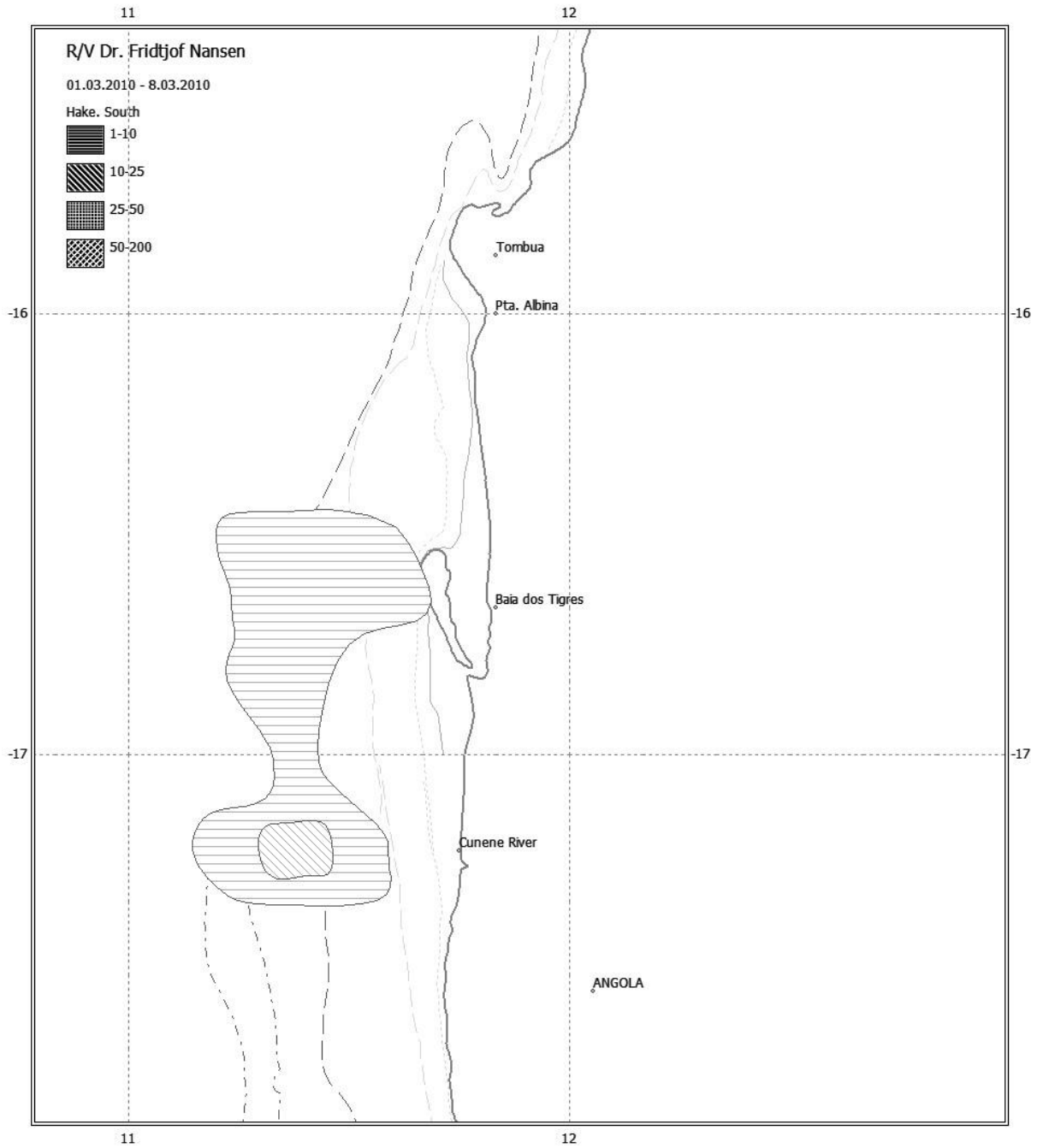
The biomass of horse mackerel was greatly fluctuating in this region mainly due to the low number of catches and variability in the distribution pattern of this species. This year, a biomass of 921 tonnes was found on the slope. In 2010 as well as last year, there were no catches of seabreams, or *P. longirostris* on the southern slope (200-600 m). The biomass estimate for *A. varidens* was 196 tonnes compared with 607 tonnes last year. Cephalopods had a biomass of 36 tonnes compared with 51 tonnes in 2009. As earlier mentioned, these estimates were highly unreliable since there were only two hauls which were the basis for the estimates.

**Table 5.1** Biomass estimates (tonnes) of important species group on the slope (200-600 m) in the southern region. CV values are indicated in brackets.

survey	Hake		Horse mackerel	Shrimps	Cephalopod	Sharks	Seabreams	<i>P. longirostris</i>	<i>A. varidens</i>
1986.1	2754 (0.84)		26 (1.00)	182 (0.16)	15 (1.00)	66 (0.40)	1261 (0.95)	0	106 (1.00)
1991.1	3285 (0.52)		62 (0.02)	47 (0.43)	43 (0.14)	463 (0.33)	325 (0.83)	21 (0.77)	0
1991.2	19798 (0.62)		549 (0.48)	0	0	506 (0.68)	2669 (0.08)	0	0
1992	10793 (0.82)		58 (1.00)	235 (0.88)	0	49 (0.19)	2035 (1.00)	15 (1.00)	161 (1.00)
1997.2	3411		13	13	0	917	413	13	0
2000	3358 (0.86)		0	44 (0.84)	0	73 (0.47)	0	44 (0.84)	0
2002	1245		0	20	14	104	0	0	0
2003	454 (1.00)		0	156 (0.91)	0	226 (0.34)	0	79 (1.00)	0
2004	5749 (0.53)		50 (0.62)	97 (0.40)	34 (0.93)	40 (0.97)	579 (0.57)	57 (0.75)	30 (1.00)
2005	882 (0.48)		24 (0.84)	134 (0.71)	15 (1.00)	56 (0.62)	0	3 (0.55)	57 (0.87)
2006	4507 (0.96)		169 (0.66)	72 (1.00)	0	5 (1.00)	0	0	0
2007	1528		0	27	0	4323	0	0	0
2008	964 (0.38)		563 (1.00)	280 (0.61)	9 (1.00)	188 (0.42)	232 (1.00)	45 (1.00)	225 (1.00)
2009	2751 (0.69)		0	705 (0.03)	51 (0.38)	192 (0.93)	0	0	607 (0.13)
2010	2336 (0.36)		921 (1.00)	729 (1.00)	36 (0.55)	4 (1.00)	0	0	196 (1.00)

### *Distribution*

Figure 5.1 shows the distribution of hake (*Merluccius spp.*) in the southern region. The distribution covered large parts of the outer shelf and the slope from Cunene to north of Baía dos Tigres. The distribution area was similar but with lower concentrations than in 2009.



**Figure 5.1** Distribution of hake (*Merluccius spp.*) in the southern region, Cunene - Tombua. Depth contours at 20, 50, 100 and 200 m.

## 5.2 Benguela – Ponta das Palmeirinhas slope

The central region of Angolan waters covered from Benguela to Ponta das Palmeirinhas, and a total of 22 successful swept-area trawl stations were accomplished on the central slope (Table 2.1).

The average catch rate on the slope was 453 kg/hour compared with 780 kg/hour in 2009 (Annex VI). The ‘demersal’ group contributed with 203 kg/hour or 23% of the mean catch

rate while the ‘pelagic’ group had an average catch rate of 18 kg/hour or 4%, the shrimps contributed to 124 kg/hour or 27%, while sharks and cephalopods contributed to 1% and <1%, respectively. The “other” group of non-commercial species dominated the catches and contributed to 200 kg/hour and 44% of the total mean catch rate. *M. polli* was caught in all but five stations, mainly deeper than 700 m, while *M. capensis* were found in one deep station in the southern part of the central slope. The average catch rate was 62 kg/hour. Seabreams (*D. macrophthalmus*) were only caught on two stations with a catch rate of 17 kg/hour. The average catch rates of *P. longirostris* (deep water rose shrimp) and *A. varidens* (red striped shrimp), which was two of the most commercially important shrimp species, were 4.1kg/hour and 11.3 kg/hour, respectively. *Nematocarcinus africana* abundantly occurred with an average catch rate of 108 kg/hour.

### *Biomass estimates*

Biomass estimates, in tonnes, of the most important groups are presented in Table 5.2. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799m). The CVs were weighted by stratum size.

The various strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. The biomass estimates of the pelagic species may not reflect the true biomass, as pelagic species are often distributed too high in the water column to be available for the bottom trawl. Some of the biomass estimates in Table 5.2 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The 2010 biomass estimate of hake (*M. polli*) was 3 800 tonnes, compared with 5 300 tonnes observed in 2009 and the 6 000 tonnes estimated in 2008, which was about 1 000 tonnes lower than the 2007 and 2006 estimates. In 2004, the biomass estimate of *M. polli* showed a peak of 16 100 tonnes. The decrease since then has been 76%. The reasons for this reduction in biomass are not clear, but the great decline is of concern.

The biomass estimate of seabreams this year was 2 400 tonnes whereas last year seabreams were only found in one station on the slope, with the biomass estimate of 170 tonnes, which was among the lowest in the time series. The biomass estimates of seabreams on the central slope have considerably fluctuated in recent years and the CV of the estimates were also relatively high. *D. macrophthalmus* was the most abundant species in this group (75% of the total seabream biomass) together with *D. angolensis* which was found in smaller quantities.

*P. longirostris* is distributed in depths between 200 and 400 m, and the biomass estimate increased from 220 tonnes in 2003 to about 1 300 tonnes in 2006. In 2007 the biomass estimate decreased to 190 tonnes, increased to above 400 tonnes in 2008 to decrease again to 180 tonnes in 2009. In 2010 the biomass has increased to 480 tonnes. However, the high CV shows that these estimates were imprecise.

The biomass estimate of *A. varidens* was 750 tonnes in 2010, similar to the estimates in 2007 and 2008. In 2009 a relatively larger estimate of 1 300 was obtained.

In contrast to the two previous shrimp species, *N. africana* is not commercially important. The 2010 estimate of *N. africana* was 6 800 tonnes and the species has shown continuous increase the last years after a drop from the 2007 estimate of 7 900 tonnes, the highest ever recorded.

The biomass estimate of Ommastrephidae on the central slope was estimated at 21 tonnes in 2010, the lowest in the time series. There has been a continuous and considerable decline the last five years since the 2005 estimate of 510 tonnes which was the highest in the time series.

Hairtails were mainly caught in the shallower areas of the slope. There has been a continuous increase in the biomass from the lower estimate of 200 tonnes in 2007. The 2010 estimate of 2 400 was an increase from the 2009 biomass estimate of 2 000 tonnes and three times compared to the 2008 estimate.

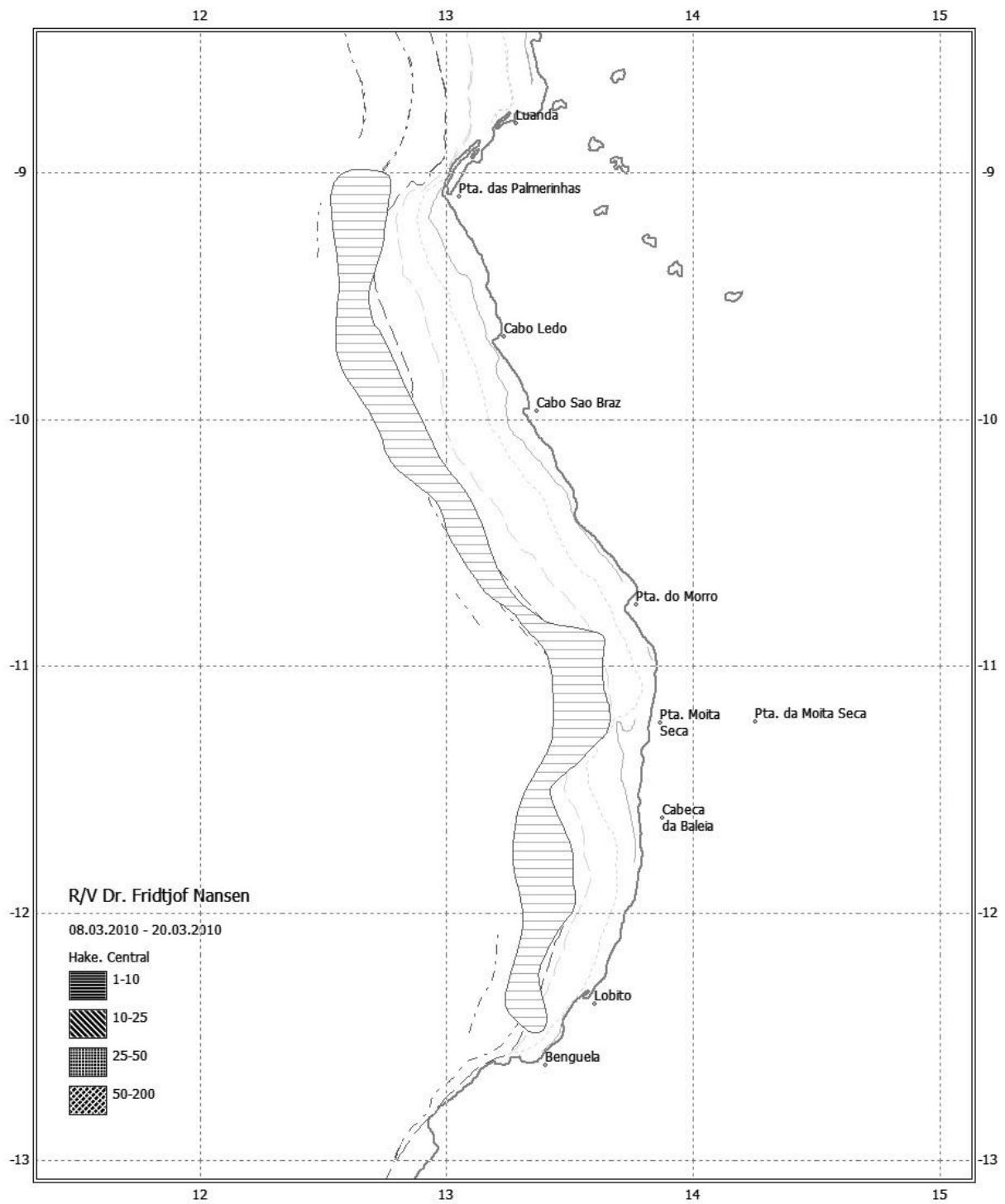
The biomass estimate of sharks was 350 tonnes in 2010. Last year, a biomass of 1 400 tonnes was observed. The biomass of shark has considerably varied in recent years and the high CV and large variability in biomass between surveys showed that there was no clear trend in the abundance of sharks. Due to an inadequate sampling gear for this groups, the figures here presented may not reflect the species composition nor the true biomass trend.

**Table 5.2** Biomass estimates (tonnes) of important species on the slope (200-800 m) in the central region. CV values are indicated in brackets.

Survey	M. polli		Shrimps		Cephalopod		Sharks		Hairtails		Seabreams	
1985.4	18790	(1.03)	2915	(1.20)	301	(1.10)	17	(2.47)	420	(1.56)	253	(1.25)
1986.1	17757	(0.74)	6306	(0.70)	1003	(0.85)	557	(0.88)	16	(2.27)	972	(2.14)
1986.2	24611	(0.00)	13247	(0.00)	57	(0.00)	0		498917	(0.00)	6446	(0.00)
1989.1	2803	(1.26)	1008	(0.95)	39	(0.76)	65	(0.69)	60	(2.06)	804	(2.17)
1989.2	4940	(0.81)	1963	(0.84)	277	(1.34)	263	(1.17)	142	(0.59)	58	(1.64)
1989.3	12633	(1.00)	1546	(0.57)	410	(0.76)	3247	(0.34)	35703	(0.01)	435	(0.98)
1991.1	11939	(0.33)	4950	(0.35)	315	(0.45)	732	(0.54)	2606	(2.13)	780	(2.05)
1991.2	10540	(0.52)	3016	(0.55)	114	(0.82)	1487	(0.88)	395	(1.25)	488	(1.12)
1992	6999	(0.28)	4436	(0.60)	189	(0.51)	2920	(0.88)	410	(1.28)	496	(1.03)
1994	3803	(0.71)	3457	(0.69)	219	(0.60)	707	(0.60)	1213	(0.82)	1188	(1.50)
1995.1	4391	(0.41)	4480	(0.69)	214	(0.79)	1216	(0.91)	1145	(0.53)	6264	(1.24)
1995.2	4781	(0.38)	4295	(0.25)	153	(0.46)	1064	(0.44)	2234	(1.21)	1291	(0.66)
1996	6440	(0.74)	6457	(0.59)	97	(0.90)	1581	(0.89)	244	(0.62)	1016	(0.47)
1997.1	10375	(0.59)	6969	(0.37)	538	(0.64)	1214	(0.87)	902	(1.01)	1858	(1.14)
1997.2	8363	(0.34)	2690	(0.53)	166	(0.28)	42	(1.23)	1013	(0.21)	5045	(1.25)
1998	9991	(0.50)	9048	(0.39)	428	(0.76)	812	(0.63)	1840	(1.46)	1643	(1.06)
1999	2995	(0.74)	1806	(0.49)	344	(0.63)	728	(0.91)	728	(0.61)	2900	(0.82)
2000	5482	(0.60)	2445	(0.45)	717	(0.50)	639	(0.74)	871	(0.91)	2059	(1.01)
2001	4763	(0.81)	2575	(0.72)	623	(0.66)	818	(1.77)	297	(1.05)	767	(1.43)
2002	3012	(0.65)	3749	(0.60)	469	(0.64)	212	(0.92)	269	(0.57)	2418	(1.98)
2003	7155	(0.90)	4087	(0.83)	420	(0.64)	104	(1.02)	178	(1.33)	606	(1.55)
2004	16127	(0.77)	7350	(0.42)	444	(0.85)	476	(1.51)	1581	(1.06)	10840	(2.00)
2005	10074	(0.58)	7135	(0.37)	578	(1.03)	307	(0.46)	2655	(1.55)	6468	(2.11)
2006	6967	(0.71)	7180	(0.38)	623	(1.02)	366	(0.85)	954	(0.86)	2422	(1.85)
2007	6947	(0.97)	8939	(0.35)	446	(1.20)	1054	(0.94)	185	(0.96)	808	(0.42)
2008	6032	(0.66)	6490	(0.33)	363	(0.97)	389	(1.34)	762	(0.51)	2003	(1.39)
2009	5302	(0.48)	8079	(0.35)	644	(1.22)	1382	(1.24)	1947	(0.83)	168	(0.00)
2010	3837	(0.56)	8072	(0.54)	179	(0.43)	350	(1.28)	2387	(1.90)	2416	(1.09)
Survey	P. longirostris		A. varidens		N. africanus		Ommastrephidae		D. macrophthalmus		D. angolensis	
1985.4	886	(1.47)	942	(2.08)	714	(1.21)	0		39	(2.37)	215	(1.41)
1986.1	653	(0.89)	492	(0.90)	3173	(1.25)	74	(1.13)	499	(2.10)	474	(2.18)
1986.2	0		0		0		0		6446	(0.00)	0	
1989.1	181	(1.22)	194	(1.13)	592	(1.86)	39	(0.76)	804	(2.17)	0	
1989.2	505	(0.84)	228	(0.74)	1020	(1.45)	240	(1.66)	26	(2.37)	33	(2.27)
1989.3	375	(0.32)	194	(0.68)	958	(1.01)	409	(0.77)	324	(1.14)	110	(2.13)
1991.1	204	(0.75)	653	(0.21)	3879	(0.45)	195	(0.75)	706	(2.09)	74	(1.79)
1991.2	190	(0.57)	105	(1.53)	2659	(0.63)	114	(0.82)	249	(1.79)	239	(1.88)
1992	610	(0.95)	366	(0.63)	3224	(0.79)	141	(0.61)	358	(1.42)	138	(1.87)
1994	579	(0.85)	647	(0.67)	2199	(1.07)	168	(0.59)	1113	(1.55)	40	(2.27)
1995.1	425	(0.95)	753	(0.45)	2460	(1.32)	30	(1.34)	6037	(1.30)	226	(0.98)
1995.2	479	(0.45)	698	(0.23)	2763	(0.37)	85	(0.64)	1196	(0.73)	95	(1.42)
1996	114	(0.53)	671	(0.37)	4971	(0.71)	41	(0.67)	974	(0.48)	42	(2.27)
1997.1	685	(0.50)	305	(0.54)	4093	(0.68)	474	(0.65)	1700	(1.29)	158	(1.61)
1997.2	2679	(0.54)	0		11	(2.27)	134	(0.24)	4864	(1.25)	180	(1.10)
1998	556	(0.63)	1192	(1.10)	7000	(0.52)	389	(0.84)	1549	(1.15)	94	(2.23)
1999	214	(0.87)	337	(1.06)	1206	(0.75)	315	(0.61)	2806	(0.87)	94	(1.60)
2000	455	(1.05)	379	(0.35)	1043	(1.02)	426	(0.57)	1954	(1.01)	105	(1.44)
2001	186	(0.44)	456	(0.63)	517	(2.35)	339	(1.08)	663	(1.70)	102	(2.27)
2002	341	(1.23)	243	(0.52)	3039	(0.75)	242	(0.77)	2307	(2.19)	111	(2.27)
2003	223	(0.44)	498	(1.07)	3284	(1.02)	409	(0.65)	514	(1.97)	92	(2.27)
2004	419	(1.08)	576	(0.44)	6204	(0.47)	350	(1.04)	10265	(2.24)	572	(2.27)
2005	574	(0.71)	792	(0.41)	5640	(0.46)	510	(1.15)	6260	(2.19)	208	(1.43)
2006	1330	(1.36)	359	(0.35)	5351	(0.38)	457	(1.08)	2138	(2.23)	284	(2.27)
2007	191	(1.32)	653	(0.17)	7913	(0.39)	138	(1.51)	612	(1.09)	196	(2.27)
2008	415	(1.35)	880	(0.27)	5085	(0.44)	138	(0.76)	1681	(2.09)	322	(2.27)
2009	182	(1.03)	1290	(0.38)	6009	(0.51)	37	(1.16)	168	(0.00)	0	
2010	479	(1.03)	746	(0.55)	6806	(0.60)	21	(1.29)	1803	(2.23)	613	(2.27)

### Distribution

Figure 5.2 shows the distribution of hake (*M. polli*) in the central region. The distribution covered the whole central slope and was similar to the observations made in previous surveys. A few higher concentrations were found along the whole region at depths between 300 and 400 m.



**Figure 5.2** Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela- Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.



### 5.3 Ponta das Palmerinhas – Congo River slope

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to Congo River, and a total of 38 successful swept-area trawl stations were accomplished on the northern slope (Table 2.1). The area north of Congo River is at present inaccessible to fisheries surveys due to the restricted oil exploitation areas. In previous years, this area was covered by some of the surveys. However, only stations south of the Congo River were included in the time series of biomass presented in Table 5.3. The various strata have been sampled with variable intensity throughout the time series, and Annex VIII shows the numbers of trawls by strata by survey.

The average catch per hour of all species was 356 kg/hour (Annex VI), and the ‘demersal’ group contributed 15% to the mean catch rate, the ‘pelagic’ group 5%, and the shrimps, cephalopods and sharks each contributed 29, 1 and 1%, respectively. The “other” group dominated the catches and contributed 49% to the total mean catch rate. *M. polli* was frequently caught on the outer shelf and the average catch rate was 29 kg/hour. Seabreams were only caught in five stations on the northern slope, and the average catch rate (only *D. angolensis*) was 9.5 kg/hour. The averages catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *N. africana* were respectively 3, 4 and 95 kg/hour.

#### *Biomass estimates*

Biomass estimates in tonnes of the most important species groups are presented in Table 5.3. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799 m). Some of the biomass estimates in Table 8.3 have a high coefficient of variation (CV), which indicates that the trends in the time series should be interpreted with care.

The biomass estimate of seabreams in 2010 was about 1 400 tonnes which is the highest estimate since 2000. As in previous surveys, *D. angolensis* was the most abundant seabream on the northern slope.

The biomass estimates for *M. polli* increased slightly 3 100 tonnes this year compared with 2009 when 2 800 tonnes was caught, the 2009 estimate was the second lowest estimate in the time series. In 2008 the biomass was 5 900 tonnes after a continuous decrease from 2004 to 2007, with 15 300, 11 000, 7 553 and 4 117 tonnes respectively.

*P. longirostris* is generally distributed in depths between 200 and 400 m, however the distribution this year continued into more shallow waters with highest abundance inside of 200 m depth, and only 389 tonnes of the overall biomass was caught on the slope. The overall biomass estimates for the northern region is still between 900 and 1 000 tonnes as it has been in the six last surveys.

The 2010 biomass estimate of *A. varidens* was about 390 tonnes. This is similar level to the 2007 estimate but considerably lower than in 2008 and especially the estimate in 2009 which was the highest since 1986 and the third highest in the time series.

*N. africana* is not a commercially important species. The 2010 biomass estimate of about 9 200 tonnes is the lowest since 2005. However, the most recent surveys indicate a high and relatively stable abundance of *N. Africana*.

The biomass estimate of Ommastrephidae in 2010 was 90 tonnes which is the lowest since the survey in 1994 and among the lowest in the time series.

The 2010 biomass estimate of hairtails was 2 200 tonnes which is about twice as high as the biomass estimates in 2009 and 2008. The high CVs and the annual variability in the biomass estimates make it difficult to conclude on the trend in biomass in recent years.

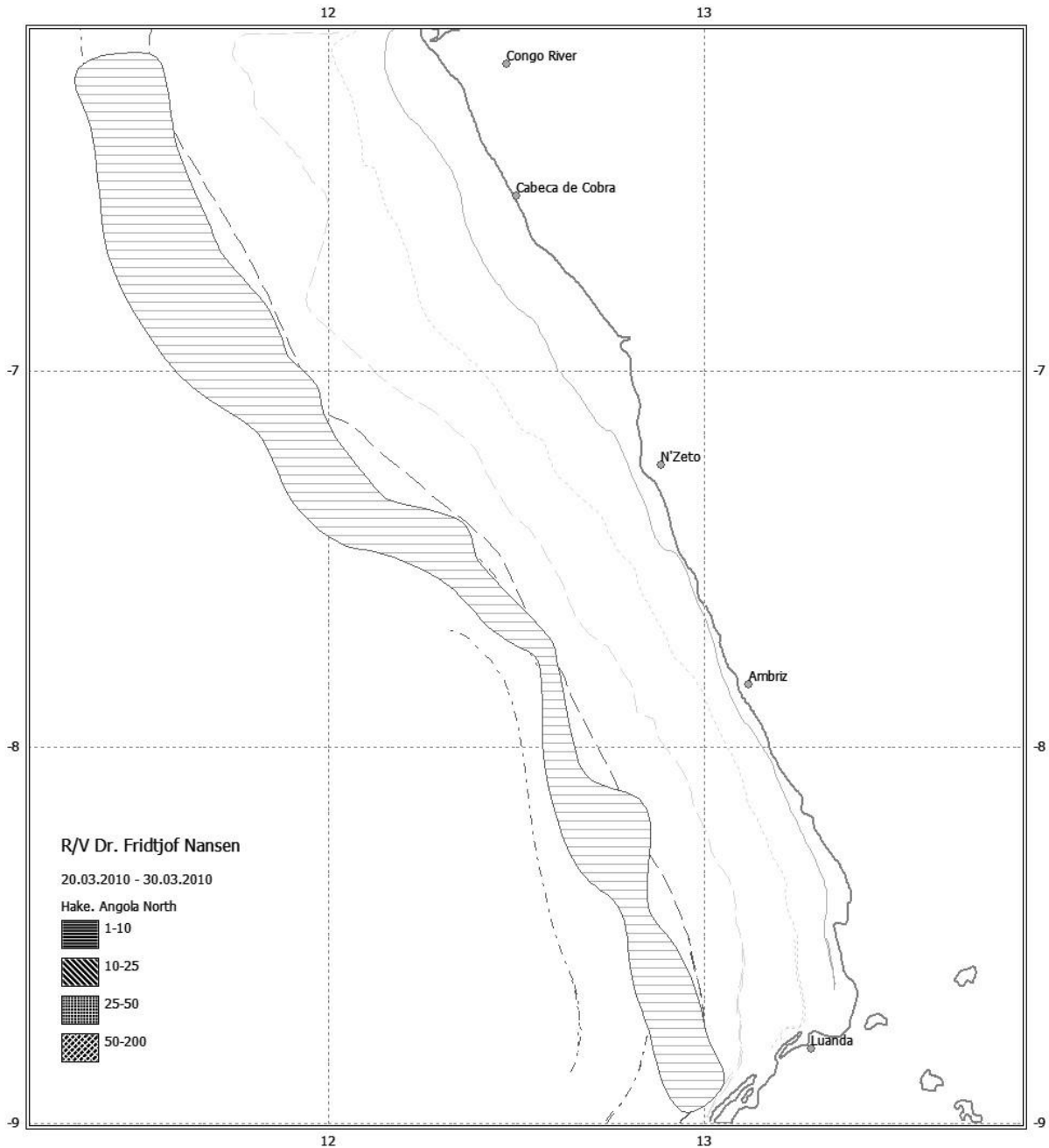
The biomass estimate of sharks in 2010 was 380 tonnes and the lowest since 2002.

**Table 5.3** Biomass estimates (tonnes) of important species on the slope (200-800 m) in the northern region. CV values are indicated in brackets.

Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Croakers
1985.1	202 (0.00)	21 (0.00)	976 (0.00)	344 (0.00)	0	0
1985.2	3,065 (0.86)	767 (1.27)	251 (0.68)	209 (1.36)	511 (2.38)	285 (0.87)
1985.3	28,753 (0.95)	11,989 (0.48)	260 (1.25)	0	1,342 (0.67)	8 (2.38)
1985.4	11,409 (0.39)	14,960 (0.25)	1,630 (0.81)	3,724 (1.41)	3,383 (0.64)	0
1986.1	27,562 (0.67)	7,854 (0.56)	277 (0.85)	4,431 (0.75)	3,228 (0.61)	19 (2.27)
1986.2	13,518 (0.78)	7,772 (1.34)	1,631 (1.23)	2,376 (1.44)	795 (0.81)	0
1989.1	8,168 (0.42)	4,370 (0.67)	166 (1.11)	375 (1.39)	352 (1.45)	1,624 (1.21)
1989.2	11,265 (0.91)	5,137 (0.36)	657 (1.05)	2,372 (0.57)	1,579 (1.97)	3 (2.27)
1989.3	19,597 (0.65)	8,671 (0.68)	135 (1.45)	1,376 (1.25)	65 (1.03)	3 (2.27)
1991.1	19,498 (0.67)	2,732 (0.34)	991 (1.05)	2,381 (0.80)	699 (0.61)	64 (1.82)
1991.2	13,290 (0.44)	8,992 (0.74)	209 (0.69)	1,462 (1.01)	1,148 (0.55)	244 (1.41)
1992	4,096 (0.48)	7,529 (0.61)	328 (0.48)	841 (0.66)	1,753 (0.37)	134 (1.36)
1994	5,892 (1.01)	9,641 (0.56)	316 (1.55)	1,367 (0.52)	2,284 (0.72)	0
1995.1	5,065 (0.31)	4,435 (0.43)	566 (1.03)	307 (0.71)	1,627 (0.69)	34 (1.36)
1996	6,954 (0.28)	14,107 (0.38)	659 (0.35)	824 (1.12)	3,399 (1.26)	0
1997.1	8,101 (0.39)	5,676 (1.67)	330 (1.80)	10 (2.27)	1,972 (1.37)	35 (2.27)
1999	3,624 (0.52)	11,539 (0.52)	1,142 (1.49)	1,060 (0.43)	3,088 (0.83)	113 (1.07)
2000	4,385 (0.54)	4,683 (0.49)	709 (0.47)	597 (0.89)	1,978 (1.04)	0
2001	4,840 (0.71)	8,283 (0.73)	1,477 (1.55)	1,966 (1.23)	1,531 (0.74)	0
2002	3,479 (0.60)	6,415 (0.74)	625 (0.87)	118 (0.74)	3,022 (1.01)	27 (1.73)
2003	5,310 (0.76)	7,986 (0.38)	421 (0.61)	1,305 (1.29)	1,237 (1.15)	27 (1.70)
2004	15,327 (1.33)	12,343 (0.33)	871 (0.70)	1,571 (0.78)	1,695 (0.57)	49 (1.91)
2005	10,994 (0.60)	10,285 (0.35)	382 (0.53)	1,180 (1.00)	1,468 (0.44)	19 (1.05)
2006	7,553 (0.51)	12,526 (0.37)	407 (0.55)	931 (1.59)	2,143 (0.74)	18 (1.79)
2007	4,117 (0.55)	14,856 (0.47)	316 (0.66)	501 (1.01)	749 (0.49)	9 (2.27)
2008	5,925 (0.37)	16,979 (0.40)	716 (0.76)	846 (0.67)	1,365 (0.79)	246 (1.28)
2009	2,814 (0.76)	15,238 (0.39)	984 (0.63)	1,152 (0.69)	1,077 (0.50)	24 (1.49)
2010	3,166 (0.73)	10,135 (0.43)	502 (0.51)	382 (0.78)	2,202 (0.84)	7 (2.27)
Survey	Seabreams	P.longirostris	A.varidens	N.africanus	Ommastrephidae	D.angolensis
1985.1	0	21 (0.00)	0	0	976 (0.00)	0
1985.2	1,541 (0.00)	0	0	0	0	1,541 (0.00)
1985.3	0	2,108 (0.88)	6,691 (0.69)	2,864 (0.90)	142 (1.78)	0
1985.4	108 (2.02)	1,166 (1.29)	538 (2.09)	12,631 (0.23)	261 (0.33)	98 (2.27)
1986.1	288 (2.27)	0	1,008 (0.48)	4,643 (0.88)	0	269 (2.27)
1986.2	66 (2.27)	419 (1.15)	204 (0.50)	6,953 (1.48)	1,429 (1.40)	0
1989.1	4,061 (2.24)	366 (1.01)	164 (1.14)	3,682 (0.81)	135 (1.37)	4,038 (2.26)
1989.2	497 (1.79)	243 (0.67)	91 (0.40)	4,699 (0.38)	645 (1.07)	496 (1.80)
1989.3	49 (1.66)	88 (1.00)	70 (1.37)	8,315 (0.72)	129 (1.47)	49 (1.66)
1991.1	527 (0.66)	205 (0.98)	15 (2.67)	2,445 (0.37)	619 (1.11)	510 (0.66)
1991.2	510 (0.90)	170 (1.05)	272 (0.80)	8,439 (0.80)	143 (0.73)	465 (0.85)
1992	1,045 (0.91)	532 (0.58)	370 (0.75)	6,602 (0.69)	281 (0.55)	1,045 (0.91)
1994	506 (0.98)	860 (0.88)	326 (0.67)	7,269 (0.73)	61 (1.16)	449 (1.08)
1995.1	597 (1.43)	162 (0.62)	267 (0.45)	3,859 (0.50)	228 (0.66)	345 (1.50)
1996	871 (1.08)	605 (1.14)	333 (0.35)	13,096 (0.40)	622 (0.37)	826 (1.13)
1997.1	878 (2.27)	1,317 (1.41)	0	4,088 (1.92)	317 (1.85)	876 (2.27)
1999	389 (0.58)	542 (0.43)	237 (0.42)	10,540 (0.58)	1,121 (1.52)	339 (0.69)
2000	1,650 (2.05)	497 (0.44)	222 (0.50)	3,777 (0.63)	509 (0.64)	1,588 (2.14)
2001	494 (2.27)	535 (0.53)	243 (0.47)	6,746 (0.90)	1,001 (2.17)	481 (2.27)
2002	213 (1.45)	800 (1.04)	127 (0.57)	5,337 (0.89)	364 (1.27)	200 (1.54)
2003	141 (1.10)	629 (1.01)	383 (0.83)	6,873 (0.42)	216 (0.83)	135 (1.08)
2004	299 (0.69)	749 (0.98)	359 (0.39)	10,930 (0.37)	316 (0.56)	284 (0.71)
2005	562 (0.81)	984 (0.63)	639 (0.51)	8,535 (0.42)	330 (0.53)	547 (0.85)
2006	343 (0.95)	923 (0.67)	391 (0.39)	11,073 (0.43)	184 (0.49)	340 (0.95)
2007	612 (0.73)	981 (0.78)	373 (0.31)	13,285 (0.52)	125 (0.89)	595 (0.77)
2008	629 (0.66)	933 (0.71)	615 (0.30)	15,267 (0.45)	205 (0.78)	593 (0.64)
2009	523 (0.87)	971 (0.68)	914 (0.32)	13,121 (0.45)	131 (0.92)	523 (0.87)
2010	1,404 (0.96)	389 (0.63)	388 (0.42)	9,207 (0.48)	92 (0.78)	1,404 (0.96)

### Distribution

Figure 5.3 shows the estimated distribution of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to Congo River, with densities  $<10 \text{ NM}^2$  in all the northern extension of its distribution.



**Figure 5.3** Distribution of hake (*Merluccius polli*) in the northern region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

## CHAPTER 6 SUMMARY

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From 1 to 31 March the 2010 demersal resource survey off Angola was successfully carried out using R/V “Dr. Fridtjof Nansen”. Except from the area between Tombua and Benguela, which is unsuitable for trawling due to poor bottom conditions, the shelf and upper slope (20-800m) from Cunene River to Congo River was covered.

In total, 191 trawl stations were carried out, of which 188 were valid and used in the biomass estimation of the demersal stocks. To map the oceanographic conditions 253 CTD stations were taken.

### 6.1 Hydrographical conditions

The demersal surveys in March are coincident with the late phase of the wet season, which causes low salinity in the surface waters on the shelf off northern and central Angola due to the freshwater coming for the coastal rivers.

Both temperature and salinity parameters in the southern region were dominated by the zonal transport of surface waters from offshore to the coast. This phenomenon was more pronounced in the Namibe zone. The main feature of this zonal transport was the presence of tropical waters characterized by high temperature (24.5 °C) and high salinity content ( $S > 36$ ). Zonal transport of surface water was also characteristic for the entire central region except in the northern area of this region (from Cabo Ledo to Ponta das Palmeirinhas). The temperature ranged from 24°C to 28°C rising from coast to offshore and salinity is decreasing northwards. The lowest values of both temperature and salinity were found near the coast probably due to the freshwater intrusion from coastal rivers (Catumbela, Longa, Keve and Kwanza) The seasonal saline front area which is the characteristic pattern of this region during summer period can be observed. Another important feature is the presence of gyres near the coastal rivers possibly due to increased river flows from heavy inland rains.

The northern region was characterized by transport of surface water flowing towards the coast. However this zonal transport met a counter-current carrying inshore coastal waters offshore, most evident in the N'zeto area where the shape of isohalines and the isotherms indicated the strength of this counter-current. The northern part of this region was dominated by the presence of surface water with lower salinity ( $S < 30$ ) indicating water from the Congo River. Gyres obtained in the south off the Congo River mouth were characterized by highest temperature (30 °C) and lowest salinity ( $S \leq 28.5$ ) content in the centre than in the surrounding areas. It was observed that as the temperature increased from coast to open sea, the salinity decreased offshore. The results showed that the year 2010 was warmer (30°C) compared with 29°C last year.

### 6.2 Biomass estimates

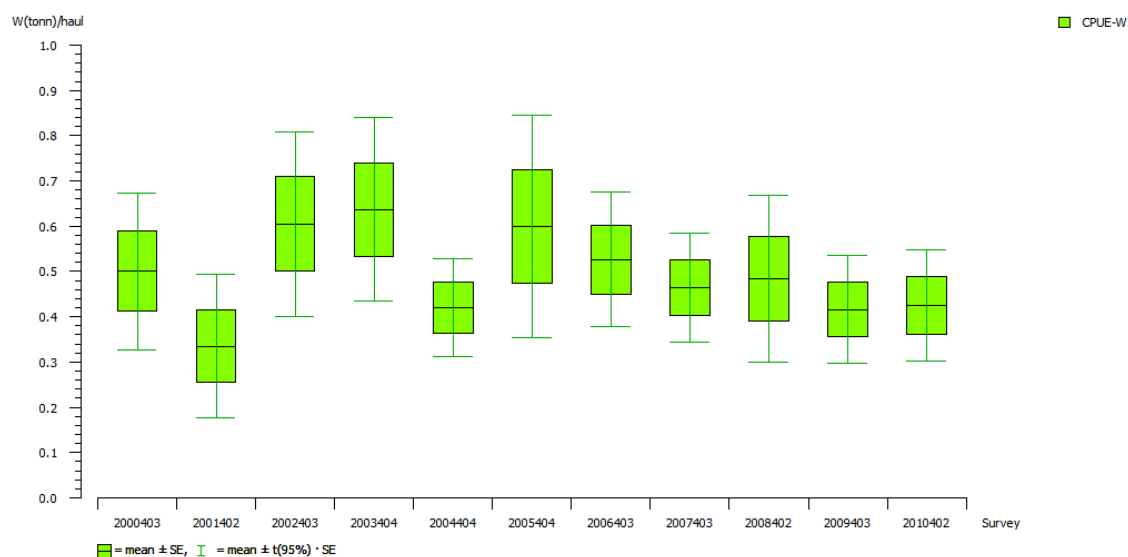
Table 6.1 presents the time series from 1985 to 2010 of the biomass estimates for the most important species on the shelf and slope in the central and northern regions of Angola. The southern region is not included, as the surveys in this region have not been properly standardized throughout the years. However, the effort, *i.e.* the number of stations by stratum

on the southern shelf, is relatively similar from 2000 to 2010 (Annex VIII) and the estimates in this period are comparable. The estimates on the southern slope are very unreliable as the number of tows is very low due to difficult trawling conditions. Tables 4.1 and 5.1 show the biomass estimates of the important species on the southern shelf and slope, respectively.

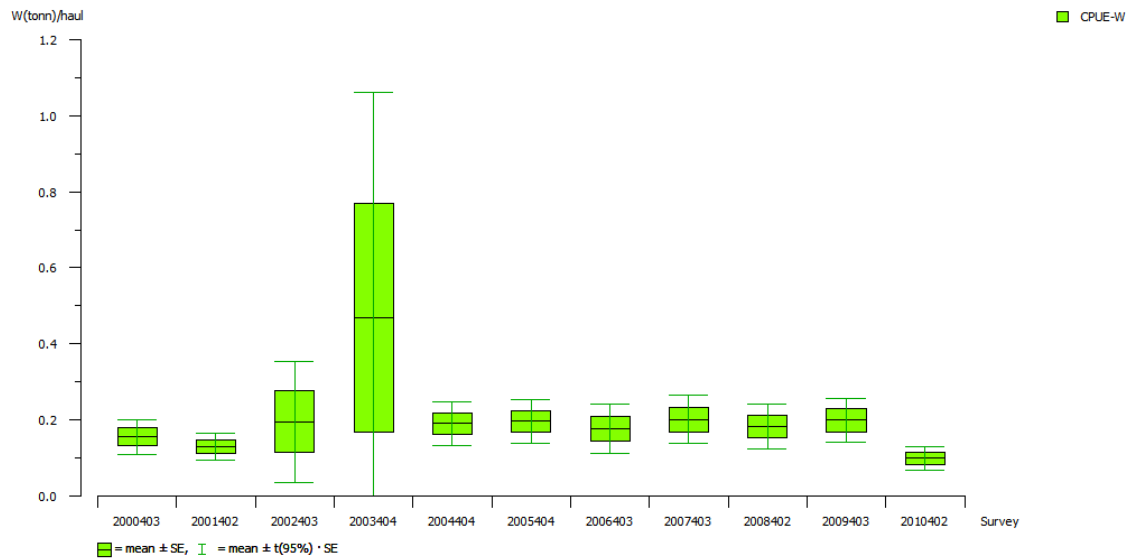
### General trend

Angola has a large number of fish and invertebrate marine species which individually has relatively low biomass but together form an important fishery. Abundance trends within stocks of low biomass may show great variation from year to year due to low frequency of occurrence and large variability in catch rates that consequently can be observed as a high CV connected to the biomass estimate. These low biomass estimates with individually large CV's may sometimes obscure the greater picture. We have therefore chosen to look at the overall trend in catch rates this year and compare these with the catch trends the last ten years when the survey methodology has been kept reasonably constant (Fig. XX). The pelagic species; *Trachurus capensis*, *T. trecae*, *Sardinella aurita*, *S. maderensis*, *Sardina pilchardus* and *Engraulis capensis* has been excluded from the analyses as these species are schooling pelagic species and may be caught in great abundance were they are caught obscure the overall tendency for the demersal species. Overall on the shelf (Fig XX) there has been a declining trend in catch rates since the recent peak in 2003 where the average catch rate was approximately 630 kg/hour. In 2010 this catch rate (excluding the pelagic species) had decreased to 450 kg/hour. The situation on the shelf should be closely monitored and it is reason for concern regarding the declining catches.

In the region offshore of 200 m depth (Fig XX) catch rates has been more stable and there is with the exception of this year's survey no clear trend in declining biomass.



**Figure XX.** Average total catch/hour for all species (except the pelagic group) on the Angolan shelf (20-200 m depth) between 2000-2010.



**Figure XX.** Average total catch/hour for all species (except the pelagic group) on the Angolan slope (>200 m depth) between 2000-2010.

### Seabreams

The seabreams biomass estimate in the southern region in 2010 was 9 200 tonnes. The abundance continued the decline observed every year since the high in 2007. The biomass consisted almost entirely of *D. macrophthalmus*. In the central and northern regions, the biomass estimate of seabreams in 2010 was 25 200 tonnes, an increase from the 2009 estimate of 18 000 tonnes and the highest observed biomass since 2005. *D. angolensis* and *D. macrophthalmus* was the most abundant species.

### Hakes

*M. capensis* is generally the dominating hake species in the south, and Angola shares this stock with Namibia. The proportion of *M. polli* in this region varies greatly. In 2010 99% of the shelf biomass of 2 500 tonnes was *M. capensis*. This estimate is in line with surveys with declining catch rates before 2009. Also in 2009 *M. capensis* dominated and there was an exceptionally high biomass of 31 000 tonnes. In the central and northern regions, *M. polli* is the only hake species found. Here, the estimated biomass of hake (*M. polli*) was 7000 tonnes, last year 8 100 tonnes was found. There has been a continues declining abundance of hake in the two regions since the 2004 estimate and this years estimate is the lowest since 1985.

### Shrimps

The two commercially important shrimp species *P. longirostris* and *A. varidens* are never found in high densities south of Tombua, and they were not caught neither in 2006 nor 2007. In 2008 both *P. longirostris* and *A. varidens* were caught in small quantities in the southern region. In 2009 no *P. longirostris* was caught, while the 600 tonnes estimated of *A. varidens* was the highest in the time series. In 2010 only *A. varidens* were caught and a biomass of 200 tonnes was estimated. The biomass estimate of *P. longirostris* for the central and northern regions in 1600 witch is the same as in 2008 and an increase since the estimate in 2009. The high CV value indicates that the estimate is relatively uncertain. The 2010 estimate for was 1

100 tonnes and is a less than half of the abundance estimate in 2009, but in line with the 2008 and 2007 estimates.

### *Grunts*

Commercially important grunt species are *P. incisus* and *P. rogeri*, but no grunts were caught in the southern region. The biomass estimate of grunts in the central and northern regions in 2010 was 10 800 tonnes. In 2009 the estimate was 8 200 tonnes, while in 2007 the estimate was 17 000 tonnes, which is the highest biomass estimate registered since 1985.

### *Croakers*

South of Tombua, the biomasses of the croakers have varied considerably between surveys during the last years. However, the 2010 estimate of 320 tonnes is the lowest in the time series and follow the declining trend seen in the 2009 and 2008 estimates (700 and 400 tonnes respectively) and represent a large decrease from the 2007 estimate of 4 200 tonnes. The biomass estimate of croakers, mainly *U. canariensis*, *A. aequidens*, *P. senegalensis* and *P. typus*, in the central and northern regions was about 8 200 tonnes in 2010. This is an increase from 2009 when 6 000 tonnes was estimated. *U. canariensis* contributed about 50% of the total biomass of croakers in 2010

### *Groupers and snappers*

Groupers and snappers were not caught in the region south of Tombua. In the central and northern regions the biomass estimates for these groups are relatively imprecise as shown by the high CVs values. The biomass estimate of groupers continued the decreased from 1 200 in 2008 to 800 tonnes in 2009 and to 640 tonnes in 2010, while the biomass estimate of snappers increased from 90 tonnes in 2008 to 290 tonnes in 2009 and decreased to 70 tonnes in 2010. The estimates in the time series show large fluctuations, making it difficult to identify any trend and conclude on the current state of these stocks.

### *Pelagic species*

For the pelagic species, the estimates of the biomass are characterized by the high variability throughout the years, particularly for horse mackerel, hairtail and barracuda. The bottom trawl is not an adequate sampling gear for the pelagic fish species; therefore no certain conclusion may be drawn for these resources. In 2010 the biomass was 77 000 tonnes in the southern region, this is in contrast to the high biomass estimates in 2008 (215 000 tonnes) and 2009 (322 000 tonnes). More adequate results are achieved from the acoustic surveys conducted later in the year.



Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	211 (0.12)	4496 (1.85)	323 (1.22)	11438 (1.90)	841 (0.92)	364 (1.93)	9986 (1.52)	44 (3.25)
1985.2	0	3324 (1.94)	139 (3.12)	694 (0.95)	451 (1.06)	3907 (3.17)	3740 (1.73)	30 (2.72)
1985.3	6524 (1.70)	16486 (1.99)	2215 (1.77)	2297 (1.00)	1079 (1.74)	205 (3.23)	17742 (1.81)	146 (2.16)
1985.4	55083 (1.46)	110950 (1.39)	15069 (1.04)	6369 (1.24)	96 (2.42)	906 (1.55)	117929 (1.33)	88 (2.09)
1986.1	29498 (1.21)	31313 (0.88)	24342 (0.60)	6925 (0.81)	5004 (2.30)	2770 (0.96)	38390 (0.72)	64 (2.00)
1986.2	52670 (0.76)	30649 (1.11)	21957 (0.43)	2935 (0.78)	5256 (1.38)	1693 (0.95)	34989 (0.97)	226 (1.51)
1989.1	16503 (1.50)	19681 (1.00)	9110 (2.48)	4465 (1.10)	3086 (2.42)	2137 (2.42)	26000 (0.85)	252 (1.08)
1989.2	14371 (0.90)	33008 (0.74)	7519 (1.03)	3198 (0.56)	1472 (1.18)	2282 (0.79)	40419 (0.66)	333 (1.16)
1989.3	25407 (1.58)	49538 (0.85)	7393 (0.65)	4797 (0.90)	21887 (1.35)	6749 (0.99)	59519 (0.85)	518 (1.43)
1991.1	31536 (0.93)	107626 (1.18)	14041 (0.97)	2235 (0.43)	3559 (1.18)	2349 (1.31)	131007 (1.03)	373 (1.28)
1991.2	30968 (1.03)	62772 (1.25)	8426 (1.07)	7351 (0.70)	4090 (1.31)	91 (1.43)	63901 (1.23)	444 (1.13)
1992	23233 (0.60)	48453 (0.69)	13613 (1.17)	6109 (0.41)	5163 (1.47)	82 (1.92)	53311 (0.67)	223 (1.14)
1994	10343 (1.00)	77944 (0.83)	11756 (1.00)	6886 (0.52)	1869 (0.91)	206 (2.91)	86549 (0.75)	926 (1.08)
1995.1	10577 (1.30)	5224 (1.74)	15395 (0.93)	1789 (0.76)	3382 (1.00)	1679 (1.09)	19756 (0.74)	393 (1.24)
1995.2	6880 (0.81)	11258 (1.17)	4499 (0.65)	979 (1.08)	1289 (1.01)	0	11370 (1.15)	201 (1.88)
1996	12219 (1.08)	83774 (0.95)	11356 (0.96)	5268 (0.49)	2641 (1.47)	1371 (1.69)	89864 (0.89)	190 (1.65)
1997.1	21911 (0.90)	64832 (0.77)	22638 (0.60)	10684 (0.56)	3004 (1.18)	9833 (1.75)	168669 (1.14)	335 (1.74)
1997.2	25581 (0.71)	97858 (0.58)	9977 (2.10)	6260 (0.42)	500 (1.73)	132 (2.45)	99747 (0.56)	289 (2.20)
1998	10366 (1.27)	4630 (1.67)	9412 (0.98)	3016 (0.62)	1122 (1.30)	2860 (2.97)	7606 (1.20)	52 (2.54)
1999	6640 (1.08)	17083 (0.78)	13687 (0.97)	3577 (1.08)	3192 (0.73)	8353 (0.87)	36949 (0.60)	69 (1.84)
2000	10118 (1.00)	25701 (0.72)	7592 (0.76)	3778 (0.44)	5098 (1.86)	2215 (1.41)	47540 (0.80)	349 (1.83)
2001	9732 (1.30)	22012 (0.77)	11282 (1.23)	4340 (1.36)	3519 (1.85)	598 (1.06)	30501 (0.66)	139 (1.11)
2002	7680 (0.93)	88411 (0.70)	10747 (1.11)	4980 (0.71)	629 (0.97)	3067 (0.78)	98922 (0.63)	820 (2.58)
2003	14240 (1.35)	35489 (0.77)	13089 (0.85)	2668 (0.56)	1925 (1.92)	4255 (0.78)	57888 (0.89)	137 (1.75)
2004	31628 (1.73)	21409 (0.71)	20863 (0.59)	3400 (0.54)	3125 (1.09)	3760 (1.00)	28088 (0.58)	63 (1.39)
2005	21112 (0.99)	10931 (0.70)	17650 (0.59)	4061 (0.47)	2421 (1.08)	2134 (1.19)	20025 (0.67)	332 (1.72)
2006	14563 (1.06)	14925 (0.52)	20214 (0.61)	3728 (0.54)	2328 (1.48)	4663 (1.09)	25200 (0.45)	183 (1.03)
2007	11157 (1.66)	10633 (0.69)	24092 (0.71)	3287 (0.56)	2789 (1.21)	3875 (0.84)	22928 (0.73)	214 (1.42)
2008	11979 (0.96)	5640 (0.69)	24057 (0.65)	3577 (0.49)	1831 (1.03)	2700 (1.20)	22856 (0.91)	168 (1.22)
2009	8120 (1.00)	14485 (0.68)	23619 (0.63)	4317 (0.64)	3009 (1.61)	11816 (1.85)	24557 (0.69)	121 (1.31)
2010	7048 (1.08)	4340 (0.74)	18990 (0.79)	3196 (0.36)	1180 (1.17)	3238 (1.99)	19971 (1.73)	163 (1.20)

Survey	Hairtails	Barracudas	Sprrs	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15711 (1.45)	254 (1.50)	0	479 (1.81)	248 (1.69)	1519 (1.67)	14690 (0.94)	138 (1.93)
1985.2	1200 (2.75)	75 (1.35)	63 (2.09)	1771 (1.30)	381 (2.18)	1302 (1.82)	12881 (0.57)	0
1985.3	3219 (1.31)	26 (2.74)	62 (3.25)	1978 (1.39)	3629 (1.56)	8979 (1.52)	22438 (1.03)	0
1985.4	7937 (0.94)	1033 (1.93)	0	4307 (0.91)	20511 (1.54)	13935 (2.05)	49738 (0.69)	3062 (1.72)
1986.1	26602 (0.92)	3099 (0.84)	470 (3.02)	1087 (1.01)	3468 (1.06)	6956 (0.82)	27435 (0.54)	3823 (1.22)
1986.2	511874 (0.02)	1874 (0.93)	0	2033 (0.84)	6995 (0.98)	9578 (0.76)	45651 (0.36)	0
1989.1	13125 (0.89)	2281 (2.15)	0	1569 (1.34)	3816 (1.85)	5864 (1.15)	25271 (0.55)	895 (1.44)
1989.2	6333 (0.70)	3674 (1.21)	53 (2.19)	3937 (2.31)	2228 (1.06)	7826 (0.78)	23569 (0.92)	1559 (1.07)
1989.3	66901 (0.69)	1068 (1.09)	316 (3.25)	1107 (1.95)	1870 (1.37)	4812 (1.06)	20807 (0.76)	1094 (1.18)
1991.1	21783 (1.13)	3322 (1.93)	106 (3.69)	817 (1.28)	1247 (0.99)	5848 (1.05)	14666 (0.48)	302 (1.48)
1991.2	9218 (0.61)	161 (1.32)	0	2043 (1.05)	2742 (1.29)	26595 (1.93)	42431 (0.47)	640 (0.95)
1992	17251 (0.74)	103 (2.12)	0	3359 (1.08)	1698 (1.27)	4772 (0.76)	40589 (0.52)	935 (1.71)
1994	31574 (2.09)	329 (1.69)	262 (3.69)	2908 (1.07)	680 (1.25)	18320 (1.46)	51379 (0.51)	1757 (1.05)
1995.1	14521 (0.59)	4222 (1.10)	594 (2.14)	1397 (1.05)	6027 (1.40)	18472 (1.67)	29271 (0.83)	2020 (1.09)
1995.2	5112 (1.63)	0	45 (3.18)	348 (3.18)	0	245 (1.89)	11363 (0.86)	680 (1.02)
1996	9254 (0.51)	1035 (1.51)	109 (3.69)	2692 (1.26)	8256 (1.04)	15215 (0.62)	39921 (0.62)	310 (0.89)
1997.1	32077 (0.82)	584 (3.05)	73 (3.25)	781 (1.08)	6427 (1.49)	21483 (0.69)	33690 (0.75)	2501 (1.05)
1997.2	23555 (0.55)	0	0	2840 (1.33)	500 (0.84)	36999 (1.82)	49236 (0.63)	5481 (1.07)
1998	30861 (2.71)	454 (1.54)	0	198 (2.33)	9117 (1.56)	8609 (1.62)	64867 (2.24)	742 (1.32)
1999	26027 (0.57)	4317 (0.82)	531 (3.49)	1642 (0.83)	8888 (1.03)	18534 (1.14)	34029 (0.45)	878 (0.82)
2000	18068 (0.62)	4556 (1.00)	294 (2.04)	1647 (1.01)	7213 (0.91)	7842 (0.67)	36443 (0.45)	1259 (1.15)
2001	24459 (1.12)	1818 (0.79)	726 (3.16)	859 (1.50)	3600 (1.17)	3203 (0.94)	22805 (0.64)	1020 (0.83)
2002	30855 (0.70)	2318 (0.99)	251 (4.74)	742 (1.17)	3223 (0.99)	9196 (0.61)	34016 (0.85)	1565 (1.41)
2003	20301 (0.67)	2825 (1.86)	186 (2.63)	1043 (0.99)	10025 (1.83)	10967 (0.58)	16230 (0.39)	1366 (1.14)
2004	20349 (1.20)	1856 (1.54)	79 (2.44)	681 (0.91)	6810 (1.15)	12196 (1.24)	32647 (1.79)	2143 (1.33)
2005	41427 (1.25)	963 (1.68)	284 (2.07)	1176 (0.88)	11735 (1.08)	13501 (0.72)	33064 (1.12)	1613 (1.07)
2006	20849 (0.49)	2561 (0.92)	51 (2.69)	819 (0.99)	6921 (1.09)	8956 (0.73)	24824 (0.57)	2607 (1.92)
2007	32508 (1.22)	2336 (1.34)	113 (1.86)	950 (1.04)	17242 (1.38)	11991 (1.40)	22191 (0.35)	1342 (1.35)
2008	18211 (0.64)	1652 (1.78)	90 (2.88)	1187 (1.53)	7411 (1.43)	12684 (0.87)	21227 (0.48)	1622 (1.30)
2009	31108 (1.11)	1743 (1.33)	292 (2.03)	779 (0.73)	8192 (0.90)	6064 (0.74)	18108 (0.41)	1432 (1.10)
2010	14826 (0.94)	1202 (1.21)	69 (1.32)	643 (0.92)	10871 (0.95)	8193 (0.78)	25208 (0.40)	1588 (1.17)

Survey	A.varidens	N.africanus	Ommastrephidae	Sepiidae	B.auritus	D.angolensis	U.cariensis	D.macrophthalmus
1985.1	0	0	11249 (1.93)	0	40729 (1.90)	2196 (0.92)	1132 (2.01)	200 (2.74)
1985.2	0	0	0	0	6842 (2.33)	2495 (0.94)	521 (2.43)	0
1985.3	0	0	0	154 (1.61)	9182 (1.99)	4490 (0.75)	602 (1.89)	0
1985.4	7633 (1.47)	3578 (1.69)	225 (2.56)	215 (2.12)	69072 (1.67)	9283 (1.12)	8921 (2.47)	6286 (2.41)
1986.1	1030 (2.63)	15804 (0.77)	2140 (1.52)	1334 (0.86)	133723 (0.46)	5700 (0.92)	2606 (1.45)	2787 (1.22)
1986.2	1485 (0.90)	4643 (1.90)	0	1828 (1.23)	36750 (0.69)	15499 (0.47)	3387 (1.33)	9215 (0.40)
1989.1	397 (1.56)	7545 (2.98)	3209 (1.51)	356 (1.29)	20488 (1.13)	2568 (0.49)	1427 (1.14)	7302 (1.28)
1989.2	400 (1.50)	4702 (1.61)	1286 (1.04)	1440 (0.67)	64268 (1.18)	9997 (2.01)	1302 (1.34)	1386 (1.44)
1989.3	285 (1.25)	5657 (0.81)	4191 (0.98)	169 (1.63)	88316 (0.76)	4888 (0.68)	1194 (2.28)	1956 (2.27)
1991.1	723 (0.58)	12194 (1.13)	1036 (0.74)	522 (0.79)	48534 (0.82)	2651 (0.49)	1657 (1.94)	3075 (1.74)
1991.2	119 (3.61)	5104 (0.95)	4144 (1.05)	793 (1.38)	3524 (1.62)	4903 (0.54)	22849 (2.25)	18054 (0.97)
1992	638 (1.21)	11662 (1.38)	3519 (0.46)	1074 (0.95)	34799 (2.01)	7229 (0.37)	1719 (1.18)	20117 (0.99)
1994	1017 (1.28)	8801 (1.33)	1931 (0.63)	3167 (0.67)	10205 (1.51)	6918 (0.52)	6075 (1.55)	23219 (0.88)
1995.1	1078 (0.95)	9729 (1.47)	164 (1.21)	637 (0.86)	40468 (0.83)	4695 (0.71)	11929 (2.11)	14010 (1.70)
1995.2	698 (0.62)	2763 (0.97)	730 (0.84)	219 (2.48)	0	1280 (0.74)	209 (2.22)	10083 (0.99)
1996	938 (0.76)	8830 (1.16)	1069 (0.45)	143 (1.55)	45646 (1.30)	6236 (0.54)	3150 (1.40)	14591 (0.66)
1997.1	639 (0.79)	17189 (0.79)	3437 (0.56)	5824 (0.95)	46071 (0.75)	5318 (0.57)	5760 (0.94)	14289 (1.72)
1997.2	0	4098 (4.15)	2491 (0.88)	1885 (0.33)	1966 (0.64)	5712 (0.90)	33214 (2.03)	31595 (0.96)
1998	1192 (2.89)	7000 (1.37)	765 (1.28)	1300 (1.09)	22014 (1.79)	2084 (0.74)	2239 (1.46)	52473 (2.75)
1999	574 (1.68)	11746 (1.14)	2028 (1.86)	375 (0.72)	131249 (0.85)	4476 (0.32)	11581 (1.59)	8181 (1.23)
2000	601 (0.71)	4820 (1.21)	1735 (0.69)	501 (1.14)	79452 (1.18)	7385 (1.25)	3771 (0.88)	8086 (1.25)
2001	699 (1.14)	7263 (1.87)	1702 (2.83)	376 (0.92)	54964 (1.01)	3482 (0.84)	1264 (1.70)	6772 (1.22)
2002	371 (0.99)	8375 (1.42)	3629 (0.94)	248 (1.23)	81844 (1.16)	3323 (0.66)	4326 (0.86)	13935 (2.04)
2003	881 (1.78)	10157 (1.06)	975 (0.88)	307 (1.61)	104724 (0.99)	4474 (0.42)	1791 (0.72)	1092 (2.52)
2004	935 (0.78)	17133 (0.68)	1319 (0.89)	394 (0.92)	51255 (0.90)	7084 (0.69)	6977 (1.87)	13884 (4.41)
2005	1431 (0.77)	14188 (0.73)	1219 (1.33)	992 (0.46)	88667 (1.17)	8473 (0.29)	5933 (0.91)	7290 (4.97)
2006	750 (0.63)	16424 (1.71)	943 (1.43)	217 (1.16)	94684 (0.91)	7236 (0.39)	6483 (0.96)	4950 (2.58)
2007	1026 (0.38)	21198 (0.81)	347 (1.74)	435 (1.70)	52925 (0.80)	8083 (0.41)	5846 (2.35)	2157 (1.41)
2008	1508 (0.49)	20352 (0.78)	896 (0.62)	306 (1.29)	70217 (1.19)	6860 (0.46)	5058 (0.93)	3176 (3.01)
2009	2204 (0.66)	19130 (0.79)	441 (0.79)	222 (1.60)	46010 (1.28)	6697 (0.44)	2409 (0.71)	876 (0.93)
2010	1134 (1.01)	16013 (0.90)	416 (0.69)	208 (1.78)	24775 (0.91)	11193 (0.51)	4443 (1.15)	2393 (4.44)

**Table 6.1** Biomass estimates (tonnes) of important species in the central and northern regions. CVs are in brackets.



# ANNEX I Records of fishing stations

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 1  
 DATE :03.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 17°11.27  
 start stop duration Lon E 11°14.72  
 TIME :01:32:37 02:03:13 30.6 (min) Purpose : 3  
 LOG : 1429.34 1430.96 1.6 Region : 4050  
 FDEPTH: 733 728 Gear cond.: 0  
 BDEPTH: 733 728 Validity : 0  
 Towing dir: 0° Wire out : 1800 m Speed : 3.2 kn  
 Sorted : 51 Total catch: 265.45 Catch/hour: 520.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia leonis	279.90	4592	53.78	
Nezumia micronychodon	140.20	4284	26.94	
Trachyrincus scabrus	31.37	127	6.03	
Deania calcea	8.82	2	1.70	
Talismania longifilis	6.76	39	1.30	
OMMASTREPHIDAE	5.98	20	1.15	
Yarellia blackfordi	5.10	265	0.98	
Lophiodes kemp	4.96	2	0.95	
Merluccius capensis	4.90	4	0.94	
HOLUTHUROIDEA	4.41	10	0.85	
Paramola cuvieri	4.39	2	0.84	
Lamprogrammus exutus	4.12	69	0.79	
Lycodes agulhensis	3.53	39	0.68	
Tetragonurus cuvieri	2.94	20	0.57	
Phrynychthys wedli	2.65	20	0.51	
Gonostoma denudata	1.96	353	0.38	
Chaceon maritae	1.82	4	0.35	
Trachurus capensis	1.08	10	0.21	
Bathyraya sp.	0.98	2	0.19	
Aristeus varidensis, female	0.98	137	0.19	
Benthodesmus tenuis	0.88	10	0.17	
Synaphobranchus kaupii	0.69	10	0.13	
Hoplostethus cadenati	0.59	10	0.11	
Nemichthys scolopaceus	0.59	20	0.11	
Aristeus varidensis, male	0.49	29	0.09	
PARALEPIDIDAE	0.39	29	0.08	
Total	520.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 2  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.93  
 start stop duration Lon E 11°25.11  
 TIME :05:35:14 05:43:53 8.7 (min) Purpose : 3  
 LOG : 1446.46 1446.91 0.5 Region : 4050  
 FDEPTH: 174 173 Gear cond.: 0  
 BDEPTH: 174 173 Validity : 0  
 Towing dir: 0° Wire out : 520 m Speed : 3.1 kn  
 Sorted : 128 Total catch: 3006.12 Catch/hour: 20851.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	19275.61	210770	92.44	2
Dentex macrophthalmus	549.29	4731	2.63	1
Merluccius capensis	443.38	1797	2.13	3
Synagrops microlepis	288.49	37332	1.38	
J E L Y F I S H	132.00	166	0.63	
Trigla lyra	97.80	818	0.47	
Zeus faber	37.53	166	0.18	
Dicologlossa cuneata	22.82	818	0.11	
Callinectes sp.	3.19	166	0.02	
Squilla mantis	1.60	166	0.01	
Total	20851.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 3  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.90  
 start stop duration Lon E 11°28.77  
 TIME :06:55:35 07:02:02 6.5 (min) Purpose : 3  
 LOG : 1453.87 1454.20 0.3 Region : 4050  
 FDEPTH: 147 145 Gear cond.: 0  
 BDEPTH: 147 145 Validity : 0  
 Towing dir: 0° Wire out : 420 m Speed : 3.0 kn  
 Sorted : 93 Total catch: 2097.28 Catch/hour: 19509.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	18206.14	639526	93.32	4
Dentex macrophthalmus	504.56	6521	2.59	5
Synagrops microlepis	479.35	195516	2.46	
Merluccius capensis	281.67	1684	1.44	6
Trigla lyra	27.35	214	0.44	
Dicologlossa cuneata	8.37	633	0.04	
GOBIIDAE	2.14	419	0.01	
Total	19509.58		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 4  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.20  
 start stop duration Lon E 11°30.83  
 TIME :07:47:43 07:53:39 5.9 (min) Purpose : 3  
 LOG : 1457.48 1457.78 0.3 Region : 4050  
 FDEPTH: 129 131 Gear cond.: 0  
 BDEPTH: 129 131 Validity : 0  
 Towing dir: 0° Wire out : 370 m Speed : 3.1 kn  
 Sorted : 91 Total catch: 1663.10 Catch/hour: 16827.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	16090.42	582334	95.62	7
Dentex macrophthalmus	583.31	5737	3.47	8
Merluccius capensis	77.81	556	0.46	
B I V A L V E S	27.72	9440	0.16	
Trigla lyra	24.08	182	0.14	
Dicologlossa cuneata	12.95	931	0.08	
Etrumeus whiteheadi	9.21	182	0.05	
Callinectes sp.	1.82	182	0.01	
Total	16827.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 5  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.57  
 start stop duration Lon E 11°37.72  
 TIME :09:11:45 09:14:40 2.9 (min) Purpose : 3  
 LOG : 1465.68 1465.84 0.2 Region : 4050  
 FDEPTH: 85 85 Gear cond.: 0  
 BDEPTH: 85 85 Validity : 4  
 Towing dir: 0° Wire out : 270 m Speed : 3.2 kn  
 Sorted : 64 Total catch: 544.07 Catch/hour: 11179.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	5265.82	252555	47.10	10
J E L Y F I S H	2619.86	12760	23.43	
B I V A L V E S	1406.10	902116	12.58	
Etrumeus whiteheadi	752.67	44712	6.73	
Trachurus trecae	382.60	13459	3.42	9
Merluccius capensis	199.11	1233	1.78	
Chelidonichthys capensis	165.82	534	1.48	
Raja miraletus	110.14	185	0.99	
Conger conger	81.99	1747	0.73	
GOBIIDAE	62.68	10664	0.56	
Sepia orbignyana	41.92	349	0.37	
Dentex macrophthalmus	33.29	699	0.30	
Dicologlossa cuneata	26.10	2630	0.23	
Squilla mantis	19.11	534	0.17	
Octopus vulgaris	12.12	185	0.11	
Total	11179.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 6  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°10.32  
 start stop duration Lon E 11°41.75  
 TIME :10:17:25 10:29:00 11.6 (min) Purpose : 3  
 LOG : 1472.42 1473.02 0.6 Region : 4050  
 FDEPTH: 42 43 Gear cond.: 0  
 BDEPTH: 42 43 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn  
 Sorted : 102 Total catch: 1122.17 Catch/hour: 5814.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	3978.24	192756	68.42	11
J E L Y F I S H	1142.75	15959	19.65	
Scomber japonicus	175.54	399	3.02	
Trachurus trecae	157.31	4389	2.71	12
Chelidonichthys capensis	119.69	456	2.06	
Arius parkii	60.98	228	1.05	
Loligo vulgaris	44.46	1197	0.76	
Umbrina canariensis	41.04	684	0.71	
Sepia orbignyana	30.78	114	0.53	
Dicologlossa cuneata	28.50	741	0.49	
Argyrosomus hololepidotus	19.69	5	0.34	
Maja squinado	7.98	741	0.14	
Engraulis encrasicolus	5.70	285	0.10	
Squilla mantis	1.71	57	0.03	
Total	5814.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 7  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.29  
 start stop duration Lon E 11°43.74  
 TIME :11:16:42 11:27:13 10.5 (min) Purpose : 3  
 LOG : 1478.29 1478.86 0.6 Region : 4050  
 FDEPTH: 26 26 Gear cond.: 0  
 BDEPTH: 26 26 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.3 kn  
 Sorted : 109 Total catch: 1433.01 Catch/hour: 8188.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	5742.29	131560	70.13	13
Engraulis encrasicolus	828.29	65966	10.12	
Chelidonichthys capensis	427.14	446	5.22	
Arius parkii	334.29	1114	4.08	
Sardinops ocellatus	305.31	10251	3.73	
Trachurus trecae	294.17	10623	3.59	14
Argyrosomus hololepidotus	64.00	11	0.78	
Sea cucumber	54.97	2526	0.67	
Trichiurus lepturus	52.74	5423	0.64	
Dicologlossa cuneata	42.34	1411	0.52	
Mustelus mustelus	21.54	74	0.26	
Scomber japonicus	8.91	371	0.11	
Starfish	6.69	1337	0.08	
Maja squinado	5.94	223	0.07	
Total	8188.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 8  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°59.55  
 start stop duration Lon E 11°43.01  
 TIME :12:51:44 12:57:40 5.9 (min) Purpose : 3  
 LOG : 1490.15 1490.50 0.4 Region : 4050  
 FDEPTH: 22 23 Gear cond.: 0  
 BDEPTH: 22 23 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.5 kn  
 Sorted : 98 Total catch: 1406.60 Catch/hour: 14208.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	5565.56	471586	39.17	
Trachurus capensis	5399.09	826354	38.00	
Sardinella aurita	3046.46	5101	21.44	
Trachurus trecae	92.63	3909	0.65	
Loligo vulgaris	47.78	2030	0.34	
Scomber japonicus	30.40	1596	0.21	
Sardinops ocellatus	17.37	1010	0.12	
Starfish	2.93	434	0.02	
Dicologlossa cuneata	2.93	293	0.02	
B I V A L V E S	2.93	293	0.02	
Total	14208.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 9  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°59.52  
 start stop duration Lon E 11°40.81  
 TIME :13:40:58 13:44:02 3.1 (min) Purpose : 3  
 LOG : 1494.50 1494.67 0.2 Region : 4050  
 FDEPTH: 34 36 Gear cond.: 0  
 BDEPTH: 34 36 Validity : 0  
 Towing dir: 0° Wire out : 145 m Speed : 3.3 kn  
 Sorted : 103 Total catch: 3188.97 Catch/hour: 62325.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	36230.62	674326	58.13	17
Trachurus capensis	21768.66	1152958	34.93	15
Trachurus trecae	1635.83	42410	2.62	16
J E L L Y F I S H	1557.07	53316	2.50	
Sardinops ocellatus	757.33	11511	1.22	
Loligo vulgaris	369.58	4241	0.59	
Starfish	6.06	2423	0.01	
Total	62325.15		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 10  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.87  
 start stop duration Lon E 11°39.29  
 TIME :14:35:51 14:53:17 17.4 (min) Purpose : 3  
 LOG : 1499.71 1500.68 1.0 Region : 4050  
 FDEPTH: 60 60 Gear cond.: 0  
 BDEPTH: 60 60 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.3 kn  
 Sorted : 58 Total catch: 175.18 Catch/hour: 602.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	450.00	6038	74.67	
Starfish	134.69	74061	22.35	
G A S T R O P O D S	12.49	4263	2.07	
Sepia orbignyana	4.23	14	0.70	
Maja squinado	0.52	38	0.09	
Octopus vulgaris	0.38	3	0.06	
BathYROconger vicinus	0.31	3	0.05	
Loligo vulgaris	0.07	7	0.01	
Total	602.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 11  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.58  
 start stop duration Lon E 11°35.02  
 TIME :15:44:34 15:53:29 8.9 (min) Purpose : 3  
 LOG : 1506.13 1506.66 0.5 Region : 4050  
 FDEPTH: 93 94 Gear cond.: 0  
 BDEPTH: 93 94 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 3.5 kn  
 Sorted : 124 Total catch: 1459.35 Catch/hour: 9816.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	8674.17	255996	88.37	18
Trachurus capensis	1015.63	36989	10.35	19
J E L L Y F I S H	46.61	632	0.47	
Starfish	30.00	4978	0.31	
G A S T R O P O D S	24.48	8852	0.25	
Squilla mantis	10.29	397	0.10	
Spondyliosoma cantharus	10.29	81	0.10	
Pterothrissus belloci	4.78	161	0.05	
Total	9816.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 12  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.95  
 start stop duration Lon E 11°28.13  
 TIME :17:03:39 17:17:52 14.2 (min) Purpose : 3  
 LOG : 1514.62 1515.30 0.7 Region : 4050  
 FDEPTH: 111 115 Gear cond.: 0  
 BDEPTH: 111 115 Validity : 0  
 Towing dir: 0° Wire out : 335 m Speed : 2.9 kn  
 Sorted : 93 Total catch: 864.62 Catch/hour: 3645.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2862.54	54936	78.52	20
Dentex macrophthalmus	537.22	6274	14.74	21
J E L L Y F I S H	128.60	2509	3.53	
G A S T R O P O D S	90.19	19450	2.47	
Dicologlossa cuneata	16.06	510	0.44	
Arius parkii	8.64	38	0.24	
Brotula barbata	1.56	38	0.04	
Pterothrissus belloci	0.80	38	0.02	
Total	3645.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 13  
 DATE :03.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°3.93  
 start stop duration Lon E 11°25.01  
 TIME :18:01:19 18:21:39 20.3 (min) Purpose : 3  
 LOG : 1520.31 1521.31 1.0 Region : 4050  
 FDEPTH: 138 135 Gear cond.: 0  
 BDEPTH: 138 135 Validity : 0  
 Towing dir: 0° Wire out : 420 m Speed : 3.0 kn  
 Sorted : 101 Total catch: 131.55 Catch/hour: 388.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	229.75	2235	59.15	
Dentex macrophthalmus	62.95	753	16.21	24
Trachurus capensis	44.70	1394	11.51	23
Pterothrissus belloci	14.85	413	3.82	
Dicologlossa cuneata	10.01	331	2.58	
Trachurus trecae	6.38	127	1.64	22
Merluccius capensis	5.37	115	1.38	25
G A S T R O P O D S	5.34	77	1.38	
Octopus vulgaris	2.21	15	0.57	
Trigla lyra	1.92	21	0.49	
GOBIIDAE	1.54	30	0.40	
Squilla mantis	1.00	35	0.26	
Sepia orbignyana	0.92	9	0.24	
Callinectes amnicola	0.62	65	0.16	
Scorpaena normani	0.50	21	0.13	
Synagrops microlepis	0.21	65	0.05	
Brotula barbata	0.15	12	0.04	
Total	388.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 14  
 DATE :03.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 17°13.51  
 start stop duration Lon E 11°21.34  
 TIME :20:30:53 21:01:41 30.8 (min) Purpose : 3  
 LOG : 1534.63 1536.25 1.6 Region : 4050  
 FDEPTH: 331 343 Gear cond.: 0  
 BDEPTH: 331 343 Validity : 0  
 Towing dir: 0° Wire out : 840 m Speed : 3.1 kn  
 Sorted : 127 Total catch: 340.65 Catch/hour: 663.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	376.63	590	56.77	26
Chlorophthalmus atlanticus	123.41	4485	18.60	
Pontinus accraensis	53.53	1042	8.07	
Nezumia sp.	46.52	1445	7.01	
Gadella maraldi	36.98	713	5.57	
Pterothrissus belloci	14.82	90	2.23	
Hymenocephalus italicus	4.09	152	0.62	
Lophiodes kempii	2.98	2	0.45	
OMMASTREPHIDAE	1.95	4	0.29	
Galeus pollii	1.01	14	0.15	
Callinectes amnicola	0.66	12	0.10	
Trachyrincus scabrus	0.47	2	0.07	
Parapandalus narval	0.27	90	0.04	
GOBIIDAE	0.04	6	0.01	
Plesiopeneus edwardsianus	0.02	4	0.00	
Total	663.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 15  
 DATE :03.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 17°0.89  
 start stop duration Lon E 11°15.21  
 TIME :23:16:42 23:47:09 30.5 (min) Purpose : 3  
 LOG : 1550.23 1551.98 1.7 Region : 4050  
 FDEPTH: 746 830 Gear cond.: 0  
 BDEPTH: 746 830 Validity : 0  
 Towing dir: 0° Wire out : 1840 m Speed : 3.4 kn  
 Sorted : 107 Total catch: 198.16 Catch/hour: 390.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	191.86	2447	49.14	36
Nezumia sp.	64.87	1525	16.61	
Nezumia micronychodon	46.54	861	11.92	
Trachyrincus scabrus	21.62	93	5.54	
Ebinania costaecanariae	13.12	12	3.36	
Lophius vomerinus	11.47	4	2.94	
OMMASTREPHIDAE	8.10	14	2.07	
Talismania longifiliis	8.06	110	2.06	
Yarrella blackfordi	3.49	213	0.89	
Hoplostethus cadenati	3.49	301	0.89	
Raja miraletus	3.27	4	0.84	
Stomias boa boa	2.98	81	0.76	
J E L Y F I S H	2.94	51	0.75	
Raja confundens	1.83	4	0.47	
Tetragonurus cuvieri	1.62	14	0.41	
Benthodesmus tenuis	0.77	12	0.20	
Lamprogrammus exultus	0.65	8	0.17	
Nemichthys scolopaceus	0.59	33	0.15	
Triplophos hemingi	0.55	69	0.14	
Laemonema laureysi	0.55	12	0.14	
Parasudis fraser-brueneri	0.51	14	0.13	
Malacocephalus laevis	0.47	14	0.12	
Raja ravidula	0.43	4	0.11	
Heterocarpus grimaldii	0.26	18	0.07	
Aristeus varidens	0.18	26	0.05	
Callinectes amnicola	0.14	4	0.04	
Stereomastis sculpta	0.08	4	0.02	
Parapenaeus longirostris	0.04	8	0.01	
Total	390.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 16  
 DATE :04.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 16°49.52  
 start stop duration Lon E 11°17.90  
 TIME :01:45:44 02:13:02 27.3 (min) Purpose : 3  
 LOG : 1563.23 1564.67 1.4 Region : 4050  
 FDEPTH: 352 341 Gear cond.: 0  
 BDEPTH: 352 341 Validity : 0  
 Towing dir: 0° Wire out : 870 m Speed : 3.2 kn  
 Sorted : 176 Total catch: 1496.18 Catch/hour: 3289.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Helicolenus dactylopterus	232.28	29039	70.90	
Trachurus capensis	220.74	3483	6.71	
Hoplostethus cadenati	194.36	5646	5.91	
Merluccius capensis	179.41	295	5.45	
S H R I M P S	127.52	70549	3.88	
Hymenoccephalus italicus	53.29	1038	1.62	
Laemonema globiceps	47.67	616	1.45	
Aristeus varidens, female	38.87	3993	1.18	
Caelorinchus sp.	30.25	545	0.92	
Pterothrissus belloci	17.06	106	0.52	
Malacocephalus laevis	14.60	229	0.44	
Aristeus varidens, male	8.09	1302	0.25	
Raja alba	7.56	35	0.23	
Sardinops ocellatus	6.86	18	0.21	
Loligo vulgaris	6.68	18	0.20	
Lophius vomerinus	4.27	2	0.13	
Total	3289.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 17  
 DATE :04.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°48.90  
 start stop duration Lon E 11°34.77  
 TIME :05:16:18 05:41:18 25.0 (min) Purpose : 3  
 LOG : 1584.38 1585.61 1.2 Region : 4050  
 FDEPTH: 95 96 Gear cond.: 0  
 BDEPTH: 95 96 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.0 kn  
 Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MUD/SHELL	0.00	0	0.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 18  
 DATE :04.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°49.70  
 start stop duration Lon E 11°41.30  
 TIME :07:02:59 07:11:33 8.6 (min) Purpose : 3  
 LOG : 1594.14 1594.55 0.4 Region : 4050  
 FDEPTH: 23 23 Gear cond.: 0  
 BDEPTH: 23 23 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 2.9 kn  
 Sorted : 108 Total catch: 1362.00 Catch/hour: 9535.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L Y F I S H	6329.40	108770	66.38	
Trachurus trecae	2536.17	314835	26.60	27
Etrumeus whiteheadi	502.82	37050	5.27	
Sepia orbignyana	67.91	175	0.71	
Gymnura micrura	28.21	14	0.30	
Starfish	16.73	2030	0.18	
Illex coindetii	11.48	532	0.12	
Maja squinado	10.57	175	0.11	
Dicologlossa cuneata	7.91	266	0.08	
Trachinus sp.	7.91	91	0.08	
Umbrina canariensis	6.16	91	0.06	
Rhinobatos albomaculatus	5.04	7	0.05	
Raja miraletus	1.75	91	0.02	
Zeus faber	1.75	91	0.02	
Mustelus mustelus	1.75	7	0.02	
Total	9535.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 19  
 DATE :04.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°35.53  
 start stop duration Lon E 11°36.23  
 TIME :09:27:30 09:57:22 29.9 (min) Purpose : 3  
 LOG : 1612.16 1613.66 1.5 Region : 4050  
 FDEPTH: 88 88 Gear cond.: 0  
 BDEPTH: 88 88 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.0 kn  
 Sorted : 103 Total catch: 1648.48 Catch/hour: 3311.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2993.77	58236	90.41	29
Dentex macrophthalmus	114.09	5078	3.45	28
Zeus faber	61.06	193	1.84	
Sepia orbignyana	47.57	193	1.44	
Scomber japonicus	23.78	129	0.72	
G A S T R O P O D S	22.18	12984	0.67	
Chelidonichthys capensis	20.57	32	0.62	
Merluccius capensis	9.00	32	0.27	
Dicologlossa cuneata	6.11	289	0.18	
Brotula barbata	4.50	96	0.14	
Illex coindetii	2.89	64	0.09	
Calappa sp.	2.89	96	0.09	
Squilla mantis	2.25	96	0.07	
GOBIIDAE	0.64	129	0.02	
Total	3311.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 20  
 DATE :04.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°34.92  
 start stop duration Lon E 11°25.85  
 TIME :11:40:18 11:53:08 12.8 (min) Purpose : 3  
 LOG : 1626.50 1627.19 0.7 Region : 4050  
 FDEPTH: 116 117 Gear cond.: 0  
 BDEPTH: 116 117 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.2 kn  
 Sorted : 129 Total catch: 1221.51 Catch/hour: 5707.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	4741.12	60341	83.06	30
Dentex macrophthalmus	499.42	509	8.75	
Chelidonichthys capensis	159.81	266	2.80	
Merluccius capensis	90.12	215	1.58	
Zeus faber	73.69	215	1.29	
Trigla lyra	43.95	355	0.77	
Spondyliosoma cantharus	30.63	47	0.54	
Atractoscion aequidens	16.87	47	0.30	
Trichiurus lepturus	16.87	178	0.30	
Scorpaena stephanica	15.09	47	0.26	
Squalus megalops	13.76	47	0.24	
Loligo vulgaris	6.66	47	0.12	
Total	5707.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 21  
 DATE :04.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°37.50  
 start stop duration Lon E 11°23.92  
 TIME :12:51:26 13:21:19 29.9 (min) Purpose : 3  
 LOG : 1632.46 1634.08 1.6 Region : 4050  
 FDEPTH: 124 127 Gear cond.: 0  
 BDEPTH: 124 127 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.3 kn  
 Sorted : 34 Total catch: 33.91 Catch/hour: 68.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Anthias anthias	27.70	450	40.70	
Octopus vulgaris	12.55	50	18.43	
G A S T R O P O D S	8.81	618	12.95	
Trachurus trecae	5.72	76	8.40	32
Merluccius capensis	2.31	20	3.39	31
Squalus megalops	2.15	2	3.16	
Arius parkii	1.77	6	2.60	
Sarda sarda	1.59	2	2.33	
Brotula barbata	1.51	42	2.21	
Dicologlossa cuneata	0.96	54	1.42	
Zeus faber	0.72	2	1.06	
Dentex macrocephalus	0.60	6	0.88	
Calappa pelii	0.42	14	0.62	
Scorpaena normani	0.36	4	0.53	
Perulibrachius rossignoli	0.34	2	0.50	
Monolene microstoma	0.20	22	0.29	
Pterothrissus belloci	0.14	4	0.21	
Callinectes amnicola	0.12	50	0.18	
Parapandalus narval	0.06	14	0.09	
Squilla mantis	0.04	4	0.06	
Total	68.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 22  
 DATE :04.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 16°34.36  
 start stop duration Lon E 11°19.01  
 TIME :16:23:00 16:50:14 27.2 (min) Purpose : 3  
 LOG : 1646.58 1647.98 1.4 Region : 4050  
 FDEPTH: 617 749 Gear cond.: 0  
 BDEPTH: 617 749 Validity : 0  
 Towing dir: 0° Wire out : 1500 m Speed : 3.1 kn  
 Sorted : 67 Total catch: 308.34 Catch/hour: 679.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hymenocephalus italicus	113.15	2007	16.66	
Trachyrincus scabrus	111.50	628	16.42	
Hoplostethus cadenati	82.60	2231	12.16	
Centrophorus squamosus	53.08	4	7.82	
Talismania longifiliis	52.86	1769	7.78	
OMMASTREPHIDAE	41.72	132	6.14	
Aristeus varidens, female	41.12	3584	6.06	
Helicolenus dactylopterus	36.17	405	5.33	
Yarella blackfordi	24.21	736	3.56	
Merluccius polli	23.68	20	3.49	34
Deania calcea	22.47	55	3.31	
Merluccius capensis	16.19	20	2.38	33
Bajacalifornia magalops	15.68	57	2.31	
S H R I M P S	14.78	5079	2.18	
Lamprogrammus exutus	8.17	156	1.20	
Ebinania costaecanarie	4.87	9	0.72	
Chaceon maritae, female	4.27	15	0.63	
Chaceon maritae, male	3.77	7	0.55	
Aristeus varidens, male	1.81	769	0.27	
Bathyrcongonger vicinus	1.65	33	0.24	
Halosaurus ovenii	1.32	18	0.19	
Stomias boa boa	1.15	42	0.17	
Synaphobranchus kaupii	0.99	24	0.15	
Bassanago albescens	0.90	9	0.13	
Heterocarpus ensifer	0.48	33	0.07	
Avocettina acuticeps	0.33	9	0.05	
Melanonm zugmayeri	0.15	18	0.02	
Laemonema laureysi	0.09	9	0.01	
Total	679.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 23  
 DATE :05.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 16°24.72  
 start stop duration Lon E 11°45.81  
 TIME :05:16:50 05:46:56 30.1 (min) Purpose : 3  
 LOG : 1709.53 1711.06 1.5 Region : 4050  
 FDEPTH: 21 22 Gear cond.: 0  
 BDEPTH: 21 22 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn  
 Sorted : 178 Total catch: 895.01 Catch/hour: 1784.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	1362.46	10734	76.37	
Trachurus trecae	353.32	6193	19.80	35
Starfish	27.31	7186	1.53	
trachurus trecae, Juvenile	11.56	1216	0.65	
Sepia orbignyana	9.09	10	0.51	
Trachinotus ovatus	5.68	120	0.32	
Illex coindetii	3.79	80	0.21	
Pomatotus saltatrix	3.29	10	0.18	
Spondyliosoma cantharus	1.89	10	0.11	
Mustelus mustelus	1.79	6	0.10	
Scomber japonicus	1.50	10	0.08	
Schedophilus pamarco	1.10	10	0.06	
Maja squinado	0.60	30	0.03	
Dicologlossa cuneata	0.60	40	0.03	
Callinectes marginatus	0.10	10	0.01	
Total	1784.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 24  
 DATE :05.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 16°24.60  
 start stop duration Lon E 11°43.49  
 TIME :06:29:02 06:49:09 20.1 (min) Purpose : 3  
 LOG : 1715.03 1716.04 1.0 Region : 4050  
 FDEPTH: 50 49 Gear cond.: 0  
 BDEPTH: 50 49 Validity : 0  
 Towing dir: 0° Wire out : 175 m Speed : 3.0 kn  
 Sorted : 63 Total catch: 132.92 Catch/hour: 396.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Starfish	325.65	76309	82.15	
Myliobatis aquila	17.83	12	4.50	
Dicologlossa cuneata	17.42	1560	4.39	
GOBIIDAE	17.09	6495	4.31	
Maja squinado	9.16	728	2.31	
Raja miraletus	4.12	6	1.04	
Calappa pelii	1.88	18	0.47	
Spondyliosoma cantharus	1.37	6	0.35	
Sepia orbignyana	1.25	12	0.32	
Illex coindetii	0.57	39	0.14	
Ophichthus sp.	0.06	6	0.02	
Total	396.38		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 25  
 DATE :05.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°12.15  
 start stop duration Lon E 11°43.59  
 TIME :08:14:15 08:45:02 30.8 (min) Purpose : 3  
 LOG : 1727.86 1729.41 1.6 Region : 4050  
 FDEPTH: 45 47 Gear cond.: 0  
 BDEPTH: 45 47 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 3.0 kn  
 Sorted : 97 Total catch: 459.91 Catch/hour: 896.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lithognathus mormyrus	355.17	1441	39.62	
Starfish	337.86	108731	37.69	
Trachurus trecae	71.54	606	7.98	37
Sepia orbignyana	42.85	136	4.78	
Pteromylaeus bovinus	41.91	14	4.67	
Gymnura altavela	26.02	4	2.90	
Dicologlossa cuneata	7.58	749	0.85	
Atractoscion aeguidens	5.52	21	0.62	
Loligo vulgaris	3.55	6	0.40	
Allotretis africana	3.22	639	0.36	
Umbrina canariensis	0.82	21	0.09	
Maja squinado	0.49	49	0.05	
Total	896.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 26  
 DATE :05.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°12.84  
 start stop duration Lon E 11°36.18  
 TIME :09:51:33 10:21:49 30.3 (min) Purpose : 3  
 LOG : 1738.13 1739.72 1.6 Region : 4050  
 FDEPTH: 73 71 Gear cond.: 0  
 BDEPTH: 73 71 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn  
 Sorted : 124 Total catch: 723.12 Catch/hour: 1433.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1040.08	11655	72.56	38
Raja miraletus	52.05	77	3.63	
Starfish	48.29	9090	3.37	
Sepia orbignyana	34.75	99	2.42	
Chelidonichthys lastoviza	31.85	56	2.22	
Dentex macrocephalus	23.96	488	1.67	40
Pagellus bellottii	23.65	278	1.65	39
Spondyliosoma cantharus	22.54	44	1.57	
Scomber japonicus	19.98	77	1.39	
Loligo vulgaris	19.62	159	1.37	
Mustelus mustelus	19.23	20	1.34	
G A S T R O P O D S	18.32	1055	1.28	
Zeus faber	16.53	34	1.15	
Dasyatis marmorata	15.96	2	1.11	
Dentex barnardi	15.64	67	1.09	
Scorpaena stephanica	8.88	44	0.62	
Squalus megalops	6.94	12	0.48	
Citharus linguatula	5.89	34	0.41	
Dicologlossa cuneata	4.88	12	0.34	
HOLUTHUROIDEA	3.77	311	0.26	
ANTENNARIIDAE	0.56	12	0.04	
Total	1433.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 27  
 DATE :08.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°35.21  
 start stop duration Lon E 13°2.89  
 TIME :11:46:35 12:18:37 32.0 (min) Purpose : 3  
 LOG : 2045.99 2047.56 1.6 Region : 4040  
 FDEPTH: 728 749 Gear cond.: 0  
 BDEPTH: 728 749 Validity : 0  
 Towing dir: 0° Wire out : 1800 m Speed : 2.9 kn  
 Sorted : 109 Total catch: 109.41 Catch/hour: 204.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	41.01	163	20.02	
Bathygadus melanobranchus	33.05	618	16.13	
Yarella blackfordi	24.81	391	12.11	
Stereomastis sp.	18.91	509	9.23	
Talismaania longifilis	16.01	122	7.81	
Aristeus varidens, female	13.22	408	6.45	
Nezumia aequalis	8.03	131	3.92	
Ebinania costaecanariae	7.15	7	3.49	
Synaphobranchus kaupii	6.07	81	2.96	
Halosaurus ovenii	4.91	54	2.39	
Stomias boa boa	4.68	103	2.28	
Dicrolene intronigra	3.75	62	1.83	
Gonostoma denudata	3.63	301	1.77	
Bassanago albescens	2.38	15	1.16	
DICERATIIDAE	2.38	4	1.16	
Raja sp.	2.13	4	1.04	
Plesiopenaeus edwardsianus	1.97	71	0.96	
S H R I M P S	1.89	296	0.92	
NETTASTOMATIDAE	1.74	4	0.85	
Gadella imberbis	1.72	26	0.84	
Aristeus varidens, male	1.20	167	0.58	
OMMASTREPHIDAE	1.03	2	0.50	
Scopelosaurus meadi	0.96	7	0.47	
Lepidopus caudatus	0.84	6	0.41	
Heterocarpus grimaldii	0.82	15	0.40	
Deania calcea	0.22	2	0.11	
Etmopterus pusillus	0.22	2	0.11	
PARALEPIDIDAE	0.06	2	0.03	
Xenodermichthys copei	0.04	2	0.02	
Dibranchius atlanticus	0.04	2	0.02	
Total	204.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 28  
 DATE :08.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°26.84  
 start stop duration Lon E 13°23.03  
 TIME :15:33:48 15:52:23 18.6 (min) Purpose : 3  
 LOG : 2069.02 2069.91 0.9 Region : 4040  
 FDEPTH: 94 91 Gear cond.: 0  
 BDEPTH: 94 91 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 2.9 kn  
 Sorted : 104 Total catch: 270.86 Catch/hour: 874.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	309.53	3946	35.39	
Synagrops microlepis	111.89	39165	12.79	
Merluccius capensis	57.48	113	6.57	44
Citharus linguatula	55.93	1098	6.39	
Pagellus bellottii	52.31	326	5.98	41
Chelidonichthys capensis	48.67	429	5.56	
Brotula barbata	46.86	110	5.36	
Gymnura micrura	40.20	3	4.60	
Dentex macrophthalmus	22.73	161	2.60	43
Umbrina canariensis	22.12	61	2.53	42
Sepia orbignyana	21.67	29	2.48	
Zeus faber	17.08	58	1.95	
Miracorvina angolensis	16.86	65	1.93	
Raja miraletus	10.17	16	1.23	
Pterothrissus belloci	10.17	181	1.16	
Pontinus kuhlii	8.65	65	0.99	
Scorpaena angolensis	5.81	87	0.66	
Dentex barnardi	4.49	16	0.51	
Dentex angolensis	3.49	45	0.40	
Uranoscopus cadenati	2.03	6	0.23	
Parapenaeus longirostris, femal	1.87	342	0.21	
Chaetodon hoefleri	1.81	6	0.21	
Brachydeuterus auritus	1.52	6	0.17	
Parapenaeus longirostris, male	0.74	161	0.08	
Total	874.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 29  
 DATE :08.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°27.43  
 start stop duration Lon E 13°24.68  
 TIME :16:34:16 16:53:45 19.5 (min) Purpose : 3  
 LOG : 2073.41 2074.44 1.0 Region : 4040  
 FDEPTH: 67 69 Gear cond.: 0  
 BDEPTH: 67 69 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 3.2 kn  
 Sorted : 170 Total catch: 366.21 Catch/hour: 1127.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	231.23	1502	20.51	
Synagrops microlepis	150.35	45396	13.34	
Brachydeuterus auritus	145.80	911	12.93	45
Torpedo torpedo	95.96	286	8.51	
Citharus linguatula	79.46	1943	7.05	
Pomadasyus jubelini	75.85	120	6.73	
Pagellus bellottii	64.62	409	5.73	47
Brotula barbata	52.67	240	4.67	
Grammolites gruvelli	50.12	616	4.45	
Pomadasyus incisus	34.17	215	3.03	
Sepia orbignyana	31.09	34	2.76	
Dasyatis marmorata	20.63	3	1.83	
Rhinobatos albomaculatus	16.32	6	1.45	
Raja miraletus	13.27	22	1.18	
Fistularia petimba	13.08	18	1.16	
Zeus faber	8.44	22	0.75	
Umbrina canariensis	7.97	86	0.71	46
Chelidonichthys capensis	6.50	46	0.58	
Argyrosomus hololepidotus	5.88	6	0.52	
Parapenaeus longirostris, femal	5.88	1234	0.52	
Serranus accraensis	4.62	58	0.41	
Pentheroscion mbizi	2.49	6	0.22	
Trachinotus ovatus	2.43	6	0.22	
Chilomycterus spinosus mauret.	2.34	12	0.21	
Parapenaeus longirostris, male	1.42	514	0.13	
Dicologlossa cuneata	1.20	6	0.11	
Conger conger	1.14	6	0.10	
Sardinella maderensis	1.02	3	0.09	
GOBIIDAE	0.55	46	0.05	
Calappa sp.	0.46	215	0.04	
Scorpaena normani	0.43	12	0.04	
Total	1127.38		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 30  
 DATE :08.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°22.46  
 start stop duration Lon E 13°16.95  
 TIME :21:03:53 21:33:57 30.1 (min) Purpose : 3  
 LOG : 2097.46 2099.03 1.6 Region : 4040  
 FDEPTH: 731 735 Gear cond.: 0  
 BDEPTH: 731 735 Validity : 0  
 Towing dir: 0° Wire out : 1650 m Speed : 3.1 kn  
 Sorted : 54 Total catch: 192.60 Catch/hour: 384.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	115.23	3500	29.98	
Hoplostethus cadenati	100.57	2899	26.17	
Tripliphos hemingi	61.46	7117	15.99	
Stomias boa boa	33.52	972	8.72	
Lamprogrammus exutus	14.33	217	3.73	
Stereomastis sp.	12.71	726	3.31	
Nezumia sp.	9.22	237	2.40	
Todarodes sp.	6.64	36	1.73	
Talismaania longifilis	6.56	237	1.71	
Aristeus varidens, female	4.89	307	1.27	
Merluccius capensis	4.61	6	1.20	
Xenodermichthys copei	4.41	56	1.15	
Loligo vulgaris	1.76	8	0.46	
Conger conger	1.54	36	0.40	
Plesiopenaeus edwardsianus	1.40	210	0.36	
Aristeus varidens, male	1.12	154	0.29	
Nemichthys scolopaceus	1.06	42	0.28	
Halosaurus ovenii	0.84	14	0.22	
Chaceon maritae, female	0.76	4	0.20	
Chaceon maritae, male	0.68	2	0.18	
Gadella sp.	0.36	22	0.09	
Scopelosaurus meadi	0.22	8	0.06	
DICERATIIDAE	0.14	8	0.04	
Dibranchius atlanticus	0.14	8	0.04	
MYCTOPHIDAE	0.08	0	0.02	
Raja confundens	0.08	8	0.02	
Total	384.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 31  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°15.87  
 start stop duration Lon E 13°24.77  
 TIME :11:17:00 11:47:19 30.3 (min) Purpose : 3  
 LOG : 2191.64 2193.21 1.6 Region : 4040  
 FDEPTH: 109 108 Gear cond.: 0  
 BDEPTH: 109 108 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 3.1 kn  
 Sorted : 86 Total catch: 85.58 Catch/hour: 169.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	62.85	342	37.10	49
Dentex barnardi	16.83	85	9.93	50
Trigla lyra	14.97	53	8.83	
Pagellus bellottii	14.05	109	8.30	51
Anthias anthias	8.65	81	5.11	
Dentex angolensis	8.51	53	5.02	48
Spherooides pachgaster	8.00	14	4.72	
Raja miraletus	6.93	10	4.09	
Raja leopardus	6.83	2	4.03	
Octopus vulgaris	5.58	4	3.30	
Zeus faber	5.01	10	2.96	
Chaetodon hoefleri	2.10	12	1.24	
Sepia orbignyana	1.62	16	0.96	
Fistularia petimba	1.41	2	0.83	
Trichiurus lepturus	1.39	2	0.82	
Citharus linguatula	1.37	42	0.81	
Branchiostegus semifasciatus *	1.23	2	0.72	
Chelidonichthys capensis	0.73	8	0.43	
G A S T R O P O D S	0.71	93	0.42	
Perulibrachrus rossignoli	0.44	2	0.26	
Arnoglossus imperialis	0.22	12	0.13	
Total	169.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 32  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.03  
 start stop duration Lon E 13°27.12  
 TIME :12:37:45 13:07:39 29.9 (min) Purpose : 3  
 LOG : 2197.64 2199.18 1.5 Region : 4040  
 FDEPTH: 98 100 Gear cond.: 0  
 BDEPTH: 98 100 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 3.1 kn  
 Sorted : 131 Total catch: 130.55 Catch/hour: 261.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	66.70	435	25.47	54
Dentex barnardi	45.54	185	17.39	55
Chelidonichthys capensis	25.44	265	9.71	
Perulibrachrus rossignoli	24.45	24	9.34	
Raja miraletus	20.66	28	7.89	
Dentex angolensis	16.15	114	6.17	53
Octopus vulgaris	11.03	8	4.21	
Zeus faber	10.05	18	3.84	
Spherooides pachgaster	7.98	16	3.05	
G A S T R O P O D S	7.76	1462	2.96	
Umbrina canariensis	6.32	18	2.41	52
Citharus linguatula	5.88	211	2.24	
Chaetodon hoefleri	3.53	22	1.35	
Branchiostegus semifasciatus *	2.95	2	1.13	
Sparus caeruleostictus *	2.41	4	0.92	
Torpedo torpedo	2.17	2	0.83	
Sepia orbignyana	1.28	16	0.49	
Pontinus accraensis	0.44	6	0.17	
Brotula barbata	0.36	2	0.14	
Arnoglossus imperialis	0.28	18	0.11	
Bathyuroconger vicinus	0.24	2	0.09	
Chaetodon marcellae	0.16	2	0.06	
Trachurus trecae	0.10	2	0.04	
Total	261.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 33  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.82  
 start stop duration Lon E 13°31.65  
 TIME :14:07:46 14:37:50 30.1 (min) Purpose : 3  
 LOG : 2205.54 2207.01 1.5 Region : 4040  
 FDEPTH: 75 74 Gear cond.: 0  
 BDEPTH: 75 74 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 2.9 kn  
 Sorted : 135 Total catch: 437.56 Catch/hour: 873.37

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	198.00	958	22.67	
Pomadasy incisus	179.80	1385	20.59	59
Brachydeuterus auritus	123.59	970	14.15	56
Citharus linguatula	79.20	2529	9.07	
Pagellus bellottii	60.04	485	6.87	57
Raja miraletus	55.89	108	6.40	
Pomadasy peroteti	50.14	84	5.74	60
Trigla lyra	16.99	148	1.94	
Rhinobatos albomaculatus	14.27	4	1.63	
Dentex barnardi	11.44	52	1.31	61
Pterothrissus bellocci	11.38	204	1.30	
Pseudupeneus prayensis	10.60	70	1.21	
Umbrina canariensis	9.06	38	1.04	58
Grammolites gruvelli	9.00	108	1.03	
Selene dorsalis	8.74	58	1.00	
Torpedo torpedo	8.42	20	0.96	
Zeus faber	7.98	20	0.91	
Lutjanus sp.	5.49	96	0.63	
Chaetodon hoefleri	3.95	20	0.45	
Trachurus trecae	2.87	44	0.33	
Atractoscion aequidens	1.86	6	0.21	
Torpedo marmorata	1.40	6	0.16	
Farapeneus longirostris	0.90	134	0.10	
Sepia orbignyana	0.76	38	0.09	
Alloteuthis africana	0.70	76	0.08	
Scorpaena stephanica	0.58	12	0.07	
Boops boops	0.32	6	0.04	
Total	873.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 34  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.85  
 start stop duration Lon E 13°34.07  
 TIME :15:14:08 15:40:02 25.9 (min) Purpose : 3  
 LOG : 2209.79 2211.13 1.3 Region : 4040  
 FDEPTH: 55 56 Gear cond.: 0  
 BDEPTH: 55 56 Validity : 0  
 Towing dir: 0° Wire out : 175 m Speed : 3.1 kn  
 Sorted : 90 Total catch: 451.87 Catch/hour: 1047.21

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy incisus	257.24	2422	24.56	65
Brachydeuterus auritus	244.50	2561	23.35	62
Pomadasy peroteti	104.29	313	9.96	
Trichiurus lepturus	82.85	927	7.91	
Pagellus bellottii	81.11	533	7.75	64
Grammolites gruvelli	57.71	881	5.51	
Citharus linguatula	53.42	1866	5.10	
Umbrina canariensis	28.62	278	2.73	63
Selene dorsalis	21.55	116	2.06	
Torpedo marmorata	18.19	23	1.74	
Raja miraletus	16.11	23	1.54	
Dentex barnardi	10.54	81	1.01	
Torpedo torpedo	8.92	12	0.85	
Lutjanus sp.	7.42	151	0.71	
Galeoides decadactylus	7.18	35	0.69	
Brotula barbata	6.84	46	0.65	
Sepia orbignyana	6.49	58	0.62	
Chilomycterus spinosus mauret.	5.33	35	0.51	
Dicologlossa cuneata	4.40	70	0.42	
Chaetodon hoefleri	4.29	23	0.41	
Trachurus trecae	4.06	93	0.39	
Pterothrissus bellocci	3.48	58	0.33	
Mycteroperca rubra	2.94	2	0.28	
Trigla lyra	2.90	23	0.28	
Scorpaena stephanica	2.09	23	0.20	
ANTENNARIIDAE	1.62	12	0.15	
Pseudupeneus prayensis	1.27	81	0.12	
Parapeneus longirostris	1.04	336	0.10	
GOBIIDAE	0.81	81	0.08	
Total	1047.21		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 35  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°56.46  
 start stop duration Lon E 13°23.29  
 TIME :18:37:44 19:09:00 31.3 (min) Purpose : 3  
 LOG : 2236.17 2237.85 1.7 Region : 4040  
 FDEPTH: 480 484 Gear cond.: 0  
 BDEPTH: 480 484 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 3.2 kn  
 Sorted : 62 Total catch: 372.90 Catch/hour: 715.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	449.71	90530	62.83	
Hoplostethus cadenati	116.62	3374	16.57	
Stomias boa boa	28.68	714	4.01	
Aristeus varidens, female	22.57	1232	3.15	
Lamprogrammus exutus	21.88	438	3.06	
Triplophos hemingi	20.61	3052	2.88	
Gadella sp.	13.01	599	1.82	
Yarella blackfordi	12.90	461	1.80	
Aristeus varidens, male	5.87	921	0.82	
Chlorophthalmus atlanticus	4.95	150	0.69	
Gadella imberbis	4.49	276	0.63	
Todaropsis eblanae	2.99	23	0.42	
Nemichthys scolopaceus	1.96	115	0.27	
Ariomma bondi	1.50	35	0.21	
Merluccius polli	1.34	2	0.19	
Halosaurus ovenii	1.15	69	0.16	
Galeus polli	0.96	6	0.13	
Chaunax pictus	0.81	23	0.11	
Hymenocephalus italicus	0.35	12	0.05	
Stereomastis sp.	0.35	23	0.05	
Benthodesmus tenuis	0.35	23	0.05	
Raja confundens	0.23	23	0.03	
S H R I M P S	0.23	35	0.03	
Xenodermichthys copei	0.12	12	0.02	
Conger conger	0.12	12	0.02	
Total	715.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 36  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°54.50  
 start stop duration Lon E 13°21.29  
 TIME :20:35:33 21:06:25 30.9 (min) Purpose : 3  
 LOG : 2242.86 2244.41 1.6 Region : 4040  
 FDEPTH: 576 583 Gear cond.: 0  
 BDEPTH: 576 583 Validity : 0  
 Towing dir: 0° Wire out : 1400 m Speed : 3.0 kn  
 Sorted : 64 Total catch: 357.00 Catch/hour: 693.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	149.17	5053	21.50	
Nematocarcinus africanus	145.29	37133	20.94	
Triplophos hemingi	83.09	11351	11.97	
Lamprogrammus exutus	70.46	1234	10.15	
Carcharhinus signatus	65.31	2	9.41	
Yarella blackfordi	64.63	1905	9.31	
Stomias boa boa	49.17	1390	7.09	
Chaceon maritae, female	14.87	58	2.14	
OMMASTREPHIDAE	8.84	19	1.27	
Aristeus varidens, female	7.19	447	1.04	
Merluccius polli	7.09	10	1.02	
Xenodermichthys copei	6.41	68	0.92	
Gadella sp.	4.86	58	0.70	
Stereomastis sp.	4.57	525	0.66	
Nezumia sp.	4.18	117	0.60	
Conger conger	2.33	97	0.34	
Gadella imberbis	1.46	224	0.21	
Nemichthys scolopaceus	1.07	49	0.15	
Talismania longifilis	0.97	78	0.14	
Scopelosaurus meadi	0.97	29	0.14	
Malaccocephalus occidentalis	0.97	117	0.14	
Aristeus varidens, male	0.78	107	0.11	
Plesiopeneus edwardsianus	0.19	19	0.03	
Total	693.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 37  
 DATE :09.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°55.42  
 start stop duration Lon E 13°19.94  
 TIME :22:50:14 23:20:16 30.0 (min) Purpose : 3  
 LOG : 2251.94 2253.49 1.6 Region : 4040  
 FDEPTH: 670 668 Gear cond.: 0  
 BDEPTH: 670 668 Validity : 0  
 Towing dir: 0° Wire out : 1600 m Speed : 3.1 kn  
 Sorted : 56 Total catch: 195.90 Catch/hour: 391.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	97.87	3034	25.01	
Lamprogrammus exultus	69.91	693	17.87	
Yarella blackfordi	62.92	2251	16.08	
Nematocarcinus africanus	61.52	15877	15.72	
Stomias boa boa	22.09	665	5.65	
Triplophos hemingi	19.64	2399	5.02	
Etmopterus polli	12.58	22	3.22	
Aristeus varidens, female	8.53	62	2.18	
Nezumia microrychodon	6.99	224	1.79	
Merluccius polli	5.25	8	1.34	
OMMASTREPHIDAE	4.96	22	1.27	
Stereomastis sp.	3.91	641	1.00	
Bathyrcongiger vicinus	2.94	98	0.75	
Xenodermichthys copei	1.82	140	0.46	
MELANOSTOMIATIDAE	1.61	22	0.41	
Aristeus varidens, male	1.33	40	0.34	
DICERATIIDAE	1.26	56	0.32	
Halosaurus ovenii	1.19	28	0.30	
Bajacalifornia magalops	1.12	28	0.29	
Cataetx laticeps	0.77	78	0.20	
Plesionika martia	0.70	112	0.18	
Gadella imberbis	0.63	28	0.16	
Nemichthys scolopaceus	0.56	36	0.14	
Acanthephyra sp.	0.49	106	0.13	
ALEPOCEPHALIDAE	0.42	22	0.11	
Cubiceps sp.	0.14	8	0.04	
Scopelosaurus meadi	0.14	8	0.04	
Total	391.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 38  
 DATE :10.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°44.68  
 start stop duration Lon E 13°18.00  
 TIME :01:20:56 01:51:10 30.2 (min) Purpose : 3  
 LOG : 2263.13 2264.74 1.6 Region : 4040  
 FDEPTH: 694 696 Gear cond.: 0  
 BDEPTH: 694 696 Validity : 0  
 Towing dir: 0° Wire out : 1670 m Speed : 3.2 kn  
 Sorted : 48 Total catch: 119.12 Catch/hour: 236.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	78.12	25272	33.05	
Stomias boa boa	48.35	1234	20.46	
Hoplostethus cadenati	35.46	1036	15.00	
Lamprogrammus exultus	21.57	143	9.13	
Yarella blackfordi	21.33	893	9.02	
Triplophos hemingi	14.52	1710	6.15	
OMMASTREPHIDAE	4.60	30	1.95	
Aristeus varidens, female	3.12	169	1.32	
Stereomastis sp.	1.43	238	0.60	
Benthodesmus tenuis	1.23	50	0.52	
Bathyrcongiger vicinus	1.03	34	0.44	
Nezumia microrychodon	0.99	34	0.42	
Xenodermichthys copei	0.89	89	0.38	
Merluccius polli	0.89	2	0.38	
Aristeus varidens, male	0.60	89	0.25	
Scopelosaurus meadi	0.40	14	0.17	
Alepocephalus sp.	0.34	24	0.14	
Merluccius sp.	0.34	34	0.14	
Acanthephyra sp.	0.30	69	0.13	
Nemichthys scolopaceus	0.30	149	0.13	
Etmopterus polli	0.24	4	0.10	
DICERATIIDAE	0.14	4	0.06	
Gadella imberbis	0.14	10	0.06	
Cataetx laticeps	0.04	14	0.02	
Total	236.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 39  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°58.13  
 start stop duration Lon E 13°29.82  
 TIME :05:09:45 05:37:45 28.0 (min) Purpose : 3  
 LOG : 2286.73 2288.21 1.5 Region : 4040  
 FDEPTH: 265 265 Gear cond.: 0  
 BDEPTH: 265 265 Validity : 0  
 Towing dir: 0° Wire out : 660 m Speed : 3.2 kn  
 Sorted : 74 Total catch: 451.07 Catch/hour: 966.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	325.51	795	33.66	
Dentex macrophthalmus	278.24	1878	28.78	66
Chlorophthalmus atlanticus	88.75	2229	9.18	
Merluccius polli	88.32	283	9.13	67
Zeus faber	51.45	154	5.32	
Synagrops microlepis	38.59	2932	3.99	
Raja miraletus	18.01	26	1.86	
Pterothrissus belloci	11.92	69	1.23	
Gadella sp.	9.52	249	0.98	
Parapenaeus longirostris, female	9.00	429	0.93	
Parapenaeus longirostris, male	7.29	420	0.75	
Bembrops greyi	6.60	120	0.68	
Raja clavata	6.43	2	0.67	
Brotula barbata	5.83	17	0.60	
Gephyroberyx darwini	5.66	26	0.59	
Scorpaena normani	5.23	86	0.54	
Hymenocephalus italicus	3.60	34	0.37	
Miracorvina angolensis	3.13	2	0.32	
MYCTOPHIDAE	1.71	1029	0.18	
Calappa sp.	1.54	34	0.16	
Illex coindetii	0.43	9	0.04	
Peristedion cataphractum	0.17	17	0.02	
Total	966.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 40  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°59.36  
 start stop duration Lon E 13°31.85  
 TIME :06:31:12 07:00:37 29.4 (min) Purpose : 3  
 LOG : 2292.61 2294.14 1.5 Region : 4040  
 FDEPTH: 103 102 Gear cond.: 0  
 BDEPTH: 103 102 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 3.1 kn  
 Sorted : 289 Total catch: 289.44 Catch/hour: 590.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	145.92	469	24.70	68
Dentex barnardi	133.27	437	22.56	71
Erythrocles monodi	86.22	159	14.60	
Anthias anthias	85.71	1035	14.51	
Atractoscion aequidens	28.57	12	4.84	
Pagellus bellottii	20.51	98	3.47	69
G A S T R O P O D S	14.59	859	2.47	
Octopus vulgaris	14.29	22	2.42	
Dentex angolensis	14.18	80	2.40	70
Zeus faber	10.61	20	1.80	
Lagocephalus laevigatus	9.20	14	1.56	
Raja miraletus	6.55	27	1.11	
Dentex macrophthalmus	5.84	31	0.99	72
Trigla lyra	4.65	41	0.79	
Plectrohinchus mediterraneus	4.12	8	0.70	
Spondylisoma cantharus	1.55	2	0.26	
Fistularia petimba	1.49	4	0.25	
Torpedo torpedo	1.08	2	0.18	
Citharus linguatula	0.65	18	0.11	
Illex coindetii	0.43	8	0.07	
Chaetodon hoefleri	0.31	2	0.05	
Sepia orbignyana	0.27	2	0.04	
Alloteuthis africana	0.24	18	0.04	
Chatrabus melanurus	0.22	2	0.04	
Monolene microstoma	0.10	6	0.02	
Syacium micrurum	0.06	4	0.01	
Peristedion cataphractum	0.04	6	0.01	
Total	590.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 41  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°59.69  
 start stop duration Lon E 13°37.16  
 TIME :07:53:39 08:24:01 30.4 (min) Purpose : 3  
 LOG : 2300.43 2301.91 1.5 Region : 4040  
 FDEPTH: 71 69 Gear cond.: 0  
 BDEPTH: 71 69 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 2.9 kn  
 Sorted : 131 Total catch: 341.36 Catch/hour: 674.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudupeneus prayensis	130.47	1017	19.35	
Pagellus bellottii	125.08	1191	18.55	74
Trachurus trecae	94.26	3185	13.98	73
Pomadasyus inciaus	91.43	719	13.56	75
Sepia orbignyana	44.79	45	6.64	
Octopus vulgaris	25.43	16	3.77	
Raja miraletus	25.43	36	3.77	
Rhinobatos albomaculatus	21.83	10	3.24	
Illex coindetii	19.72	375	2.92	
Pomadasyus jubelini	19.01	26	2.82	
Citharus linguatula	16.63	468	2.47	
Zeus faber	13.10	26	1.94	
Trichiurus lepturus	12.84	36	1.90	
Fistularia petimba	5.39	6	0.80	
Gymnura altavela	5.33	71	0.79	
G A S T R O P O D S	4.56	225	0.68	
Uranoscopus polli	3.08	10	0.46	
Torpedo torpedo	2.77	6	0.41	
Chilomycterus spinosus mauret.	2.15	16	0.32	
Umbrina canariensis	2.09	6	0.31	
Trigla lyra	1.84	26	0.27	
Dentex barnardi	1.54	26	0.23	
Monolene microstoma	1.48	113	0.22	
Brachydeuterus auritus	1.07	6	0.16	
Chaetodon hoefleri	0.87	6	0.13	
Boops boops	0.87	6	0.13	
Lutjanus agennes	0.55	10	0.08	
Pontinus accraensis	0.55	6	0.08	
Sardinella aurita	0.14	6	0.02	
Bembrops greyi	0.10	6	0.01	
Total	674.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 42  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°2.45 Lon E 13°38.90  
 start stop duration Purpose : 3  
 TIME :09:14:45 09:44:53 30.1 (min) Region : 4040  
 LOG : 2306.05 2307.57 1.5 Validity : 0  
 FDEPTH: 53 58 Gear cond.: 0  
 BDEPTH: 53 58 Validity : 0  
 Towing dir: 0° Wire out : 160 m Speed : 3.0 kn  
 Sorted : 142 Total catch: 1208.26 Catch/hour: 2405.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1093.10	13977	45.45	77
Pomadasyus incisus	420.50	3741	17.48	80
Pagellus bellottii	235.20	1879	9.78	76
Trachurus trecae	187.82	1557	7.81	78
Pseudotolithus senegalensis	87.15	135	3.62	79
Trichiurus lepturus	79.53	424	3.31	
Rhinobatos albomaculatus	42.30	52	1.76	
Citharus linguatula	41.47	1541	1.72	
Raja miraletus	36.39	86	1.51	
Pseudupeneus prayensis	34.70	271	1.44	
Umbrina canariensis	25.90	102	1.08	
Ephippion guttifer	21.50	18	0.89	
Fomadasyus jubelini	21.16	52	0.88	
Sepia orbignyana	20.48	68	0.85	
Lithognathus mormyrus	18.10	52	0.75	
Galeoides decadactylus	15.07	86	0.63	
Grammolites gruvelli	9.65	338	0.40	
Selene dorsalis	4.92	102	0.20	
Chaetodon hoeffleri	2.89	18	0.12	
Dentex barnardi	2.55	68	0.11	
Boops boops	2.03	18	0.08	
Argyrosomus hololepidotus	1.69	18	0.07	
Monolele microstoma	0.68	52	0.03	
Pontinus accraensis	0.52	18	0.02	
Total	2405.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 43  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°48.79 Lon E 13°45.79  
 start stop duration Purpose : 3  
 TIME :11:25:19 11:55:28 30.2 (min) Region : 4040  
 LOG : 2321.54 2323.17 1.6 Validity : 0  
 FDEPTH: 25 24 Gear cond.: 0  
 BDEPTH: 25 24 Validity : 0  
 Towing dir: 0° Wire out : 135 m Speed : 3.2 kn  
 Sorted : 110 Total catch: 281.43 Catch/hour: 559.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	146.98	1448	26.25	
Ilisha africana	112.66	2079	20.12	
Pteroscion pelli	63.92	2532	11.42	
Pseudotolithus typus	33.32	185	5.95	84
Galeoides decadactylus	25.86	384	4.62	
Fomadasyus jubelini	18.40	16	3.29	
Sardinella aurita	17.07	189	3.05	81
Brachydeuterus auritus	15.92	593	2.84	
Dasyatis marmorata	15.10	2	2.70	
Pseudotolithus senegalensis	9.95	20	1.78	83
Dicologlossa cuneata	9.91	225	1.77	
Torpedo torpedo	9.71	6	1.73	
Sphyrna sphyraena	9.05	149	1.62	
Sardinella maderensis	9.01	86	1.61	82
Trachurus trecae	7.46	129	1.33	
Dasyatis margarita	7.22	6	1.29	
Raja miraletus	6.47	16	1.15	
Torpedo marmorata	6.23	36	1.11	
Pomadasyus incisus	5.53	90	0.99	
Cynoglossus canariensis	4.77	6	0.85	
Grammolites gruvelli	4.77	70	0.85	
Umbrina canariensis	3.54	60	0.63	85
Atractoscion aequidens	2.98	10	0.53	
Selene dorsalis	2.55	149	0.45	
penaeus notialis,female	2.39	36	0.43	
penaeus notialis,male	1.55	50	0.28	
MUGILIDAE	1.45	10	0.26	
Chloroscombrus chrysurus	1.35	16	0.24	
Pagellus bellottii	0.95	6	0.17	
Psettodes belcheri	0.80	6	0.14	
Euclinostomus melanopterus	0.70	6	0.12	
Parapenaeopsis atlantica	0.60	139	0.11	
Squilla mantis	0.56	16	0.10	
Stromateus fiatola	0.40	16	0.07	
ANTENNARIIDAE	0.36	6	0.06	
Sepia officinalis hierredda	0.30	20	0.05	
Scorpaena angolensis	0.10	6	0.02	
Total	559.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 44  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°47.47 Lon E 13°40.85  
 start stop duration Purpose : 3  
 TIME :12:55:07 13:25:49 30.7 (min) Region : 4040  
 LOG : 2329.40 2331.00 1.6 Validity : 0  
 FDEPTH: 64 65 Gear cond.: 0  
 BDEPTH: 64 65 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.1 kn  
 Sorted : 157 Total catch: 361.93 Catch/hour: 707.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	250.83	2490	35.46	
Trichiurus lepturus	80.01	1221	11.31	
Raja miraletus	69.89	80	9.88	
Pomadasyus peroteti	53.37	158	7.55	88
Pagellus bellottii	42.70	328	6.04	87
Trachurus trecae	30.57	809	4.32	86
Pomadasyus incisus	23.14	139	3.27	
Torpedo torpedo	19.92	27	2.82	
Pseudotolithus typus	18.98	23	2.68	
Citharus linguatula	18.88	979	2.67	
Pseudupeneus prayensis	18.70	145	2.64	
Umbrina canariensis	17.71	145	2.50	89
Grammolites gruvelli	14.83	256	2.10	
Pseudotolithus senegalensis	13.04	14	1.84	
Galeoides decadactylus	8.89	31	1.26	
Selene dorsalis	7.95	55	1.12	
Boops boops	4.50	125	0.64	
Illex coindetii	3.42	543	0.48	
Argyrosomus hololepidotus	3.15	4	0.44	
Lithognathus mormyrus	1.80	4	0.25	
Sepia orbignyana	1.58	10	0.22	
Sardinella aurita	1.25	4	0.18	
Dentex barnardi	1.11	4	0.16	
Chilomycterus spinosus mauret.	0.66	4	0.09	
Cynoglossus canariensis	0.27	14	0.04	
Cynoglossus browni	0.21	23	0.03	
Total	707.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 45  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°46.45 Lon E 13°32.90  
 start stop duration Purpose : 3  
 TIME :14:48:44 15:18:28 29.7 (min) Region : 4040  
 LOG : 2340.69 2342.22 1.5 Validity : 0  
 FDEPTH: 111 111 Gear cond.: 0  
 BDEPTH: 111 111 Validity : 0  
 Towing dir: 0° Wire out : 295 m Speed : 3.1 kn  
 Sorted : 70 Total catch: 139.64 Catch/hour: 281.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	71.82	476	25.49	90
Dentex macrophthalmus	46.40	295	16.47	93
Synagrops microlepis	30.26	3050	10.74	
Boops boops	27.84	319	9.88	
Trichiurus lepturus	20.38	20	7.23	
Lagocephalus laevigatus	18.56	52	6.59	
Citharus linguatula	12.10	448	4.30	
Trigla lyra	10.05	117	3.57	
Pagellus bellottii	6.38	48	2.26	92
G A S T R O P O D S	6.33	1081	2.25	
Raja miraletus	5.89	16	2.09	
Octopus vulgaris	5.57	12	1.98	
Zenopsis conchifer	4.03	8	1.43	
Brotula barbata	3.83	8	1.36	
Branchiostegus semifasciatus *	3.43	4	1.22	
Trachurus trecae	2.82	81	1.00	91
Pterothrissus belloci	2.50	16	0.89	
Scorpaena angolensis	1.69	24	0.60	
Scorpaena angolensis	0.97	4	0.34	0
Scomber japonicus	0.44	4	0.16	
Dentex barnardi	0.40	4	0.14	
Total	281.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 46  
 DATE :10.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°44.37 Lon E 13°28.34  
 start stop duration Purpose : 3  
 TIME :16:20:43 16:52:39 31.9 (min) Region : 4040  
 LOG : 2348.06 2349.63 1.6 Validity : 0  
 FDEPTH: 162 163 Gear cond.: 0  
 BDEPTH: 162 163 Validity : 0  
 Towing dir: 0° Wire out : 430 m Speed : 2.9 kn  
 Sorted : 61 Total catch: 195.41 Catch/hour: 367.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	159.02	16139	43.29	
Brotula barbata	80.92	96	22.03	
Pterothrissus belloci	31.30	229	8.52	
Umbrina canariensis	15.90	23	4.33	95
Dentex angolensis	12.97	45	3.53	94
Raja miraletus	10.36	13	2.82	
Bembrops greyi	9.51	81	2.59	
Parapenaeus longirostris	8.67	3438	2.36	
Trichiurus lepturus	7.31	43	1.99	
Merluccius polli	5.75	17	1.57	
Bembrops heterurus	3.52	846	0.96	
Syacium micrurum	3.12	105	0.85	
Scorpaena normani	2.74	13	0.75	
Trigla lyra	2.65	17	0.72	
Lagocephalus laevigatus	1.99	4	0.54	
MYCTOPHIDAE	1.82	568	0.50	
G A S T R O P O D S	1.82	288	0.50	
Sepia orbignyana	1.35	9	0.37	
Scylliorhinus cervigoni	1.18	4	0.32	
Todarodes sagittatus	0.98	4	0.27	
Illex coindetii	0.98	34	0.27	
Gephyroberyx darwini	0.92	4	0.25	
GOBIIDAE	0.81	182	0.22	
Boops boops	0.41	4	0.11	
SOLEIDAE	0.38	4	0.10	
Citharus linguatula	0.34	17	0.09	
Squilla mantis	0.34	9	0.09	
Peristedion cataphractum	0.24	4	0.07	
Total	367.31		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 47  
 DATE :10.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°44.56  
 start stop duration Lon E 13°22.87  
 TIME :18:29:04 18:59:05 30.0 (min) Purpose : 3  
 LOG : 2357.68 2359.12 1.4 Region : 4040  
 FDEPTH: 353 358 Gear cond.: 0  
 BDEPTH: 353 358 Validity : 0  
 Towing dir: 0° Wire out : 870 m Speed : 2.9 kn  
 Sorted : 27 Total catch: 111.90 Catch/hour: 223.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hymenocephalus italicus	67.16	7417	30.03	
Merluccius polli	61.56	234	27.52	96
Nematocarcinus africanus	40.17	17616	17.96	
Gadella sp.	22.49	22	10.05	
Etmopterus polli	12.23	366	5.47	
Helicolenus dactylopterus	2.22	36	0.99	
Aristeus varidens, female	1.92	108	0.86	
Cynoponticus ferox	1.92	12	0.86	
Gadella imberbis	1.86	54	0.83	
Chaceon maritae	1.50	6	0.67	
Halosaurus ovenii	1.38	36	0.62	
Parapenaeus longirostris	1.14	36	0.51	
Nezumia sp.	1.14	36	0.51	
MYCTOPHIDAE	1.08	1379	0.48	
Chlorophthalmus atlanticus	0.90	24	0.40	
Aristeus varidens, male	0.84	150	0.38	
Chaunax pictus	0.72	54	0.32	
Callinectes sp.	0.72	6	0.32	
Conger conger	0.60	12	0.27	
Hoplostethus cadenati	0.56	12	0.25	
Stomias affinis	0.48	12	0.21	
Malacocephalus sp.	0.42	6	0.19	
Yarella blackfordi	0.36	12	0.16	
Lophius sp.	0.30	6	0.13	
Total	223.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 48  
 DATE :10.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°30.95  
 start stop duration Lon E 13°21.24  
 TIME :20:55:08 21:25:56 30.8 (min) Purpose : 3  
 LOG : 2371.59 2373.16 1.6 Region : 4040  
 FDEPTH: 382 388 Gear cond.: 0  
 BDEPTH: 382 388 Validity : 0  
 Towing dir: 0° Wire out : 970 m Speed : 3.1 kn  
 Sorted : 96 Total catch: 248.69 Catch/hour: 484.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	231.54	71059	47.78	
Merluccius polli	190.00	171	39.21	
Gadella sp.	17.99	335	3.71	
Hymenocephalus italicus	13.82	1384	2.85	
Chlorophthalmus atlanticus	6.78	374	1.40	
Hoplostethus cadenati	5.16	171	1.07	
Aristeus varidens, female	5.16	285	1.07	
Chaunax pictus	2.12	133	0.44	
Yarella blackfordi	1.93	57	0.40	
Stomias affinis	1.83	45	0.38	
Parapenaeus longirostris, femal	1.46	146	0.30	
Etmopterus polli	1.42	76	0.29	
Helicolenus dactylopterus	1.17	16	0.24	
MYCTOPHIDAE	0.82	852	0.17	
Halosaurus ovenii	0.82	70	0.17	
Gadella imberbis	0.70	19	0.14	
Aristeus varidens, male	0.60	158	0.12	
Nezumia sp.	0.41	19	0.08	
Todaropsis eblanae	0.31	6	0.06	
Callinectes sp.	0.19	6	0.04	
Lophiodes kempii	0.16	6	0.03	
Bathyrroconger vicinus	0.10	16	0.02	
Dibranchius atlanticus	0.06	6	0.01	
Triplophos hemingi	0.06	10	0.01	
Total	484.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 49  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.12  
 start stop duration Lon E 13°29.94  
 TIME :05:09:54 05:39:54 30.0 (min) Purpose : 3  
 LOG : 2388.82 2390.41 1.6 Region : 4040  
 FDEPTH: 103 102 Gear cond.: 0  
 BDEPTH: 103 102 Validity : 0  
 Towing dir: 0° Wire out : 310 m Speed : 3.2 kn  
 Sorted : 76 Total catch: 198.11 Catch/hour: 396.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	194.48	1362	49.08	
Trichiurus lepturus	31.50	110	7.95	
Citharus linguatula	21.98	660	5.55	
Brotula barbata	21.68	16	5.47	
Pterothrissus belloci	19.18	202	4.84	
Dentex macrophthalmus	18.20	140	4.59	97
Dentex angolensis	16.90	110	4.27	98
Raja clavata	13.26	6	3.35	
Trachurus trecae	10.96	400	2.77	99
Pagellus bellottii	8.78	46	2.22	
Scorpaena normani	8.62	72	2.18	
Lagocephalus laevigatus	6.96	16	1.76	
Sepia orbignyana	5.92	62	1.49	
Umbrina canariensis	5.14	10	1.30	
Alloteuthis africana	2.80	1514	0.71	
Chelidonicichthys gabonensis	2.28	16	0.58	
Saurida brasiliensis	1.98	410	0.50	
Boops boops	1.76	20	0.44	
Bembrops greyi	1.24	16	0.31	
Illex coindetii	1.20	32	0.30	
Conger conger	0.78	6	0.20	
Peristedion cataphractum	0.62	10	0.16	
Total	396.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 50  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.03  
 start stop duration Lon E 13°34.83  
 TIME :06:31:29 07:01:40 30.2 (min) Purpose : 3  
 LOG : 2395.80 2397.35 1.6 Region : 4040  
 FDEPTH: 62 63 Gear cond.: 0  
 BDEPTH: 62 63 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 3.1 kn  
 Sorted : 106 Total catch: 351.29 Catch/hour: 698.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	169.21	4178	24.24	101
Pomadasys incisus	101.32	787	14.51	100
Pagellus bellottii	93.45	708	13.38	103
Raja miraletus	38.36	72	5.49	
Octopus vulgaris	33.77	34	4.84	
Pseudupeneus prayensis	30.17	105	4.32	
Citharus linguatula	28.26	886	4.05	
Trichiurus lepturus	22.42	52	3.21	
Dentex barnardi	21.05	111	3.01	102
Rhinobatos albomaculatus	17.05	6	2.44	
Sepia orbignyana	16.79	34	2.41	
Selene dorsalis	14.03	91	2.01	
Dentex angolensis	13.12	282	1.88	104
Sphyræna guachancho	12.46	52	1.78	
Atractoscion aequidens	12.00	6	1.72	
Lithognathus mormyrus	10.75	20	1.54	
Grammolites gruvelli	10.43	183	1.49	
Chelidonicichthys gabonensis	9.90	34	1.42	
Brotula barbata	6.36	14	0.91	
Lutjanus agennes	6.36	6	0.91	
Brachydeuterus auritus	5.84	52	0.84	
Umbrina canariensis	4.91	34	0.70	
Alloteuthis africana	4.71	1574	0.67	
Sardinella aurita	2.68	111	0.38	
Zeus faber	2.62	6	0.38	
Chilomycterus spinosus mauret.	2.37	14	0.34	
G A S T R O P O D S	1.89	388	0.27	
Boops boops	1.37	34	0.20	
Saurida brasiliensis	1.31	493	0.19	
Torpedo torpedo	1.11	6	0.16	
Branchiostegus semifasciatus *	0.91	6	0.13	
Monolele microstoma	0.91	60	0.13	
Chaetodon marcellae	0.26	6	0.04	
Total	698.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 51  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°30.41  
 start stop duration Lon E 13°38.22  
 TIME :07:48:25 08:18:58 30.5 (min) Purpose : 3  
 LOG : 2402.73 2404.30 1.6 Region : 4040  
 FDEPTH: 42 42 Gear cond.: 0  
 BDEPTH: 42 42 Validity : 0  
 Towing dir: 0° Wire out : 135 m Speed : 3.1 kn  
 Sorted : 115 Total catch: 114.77 Catch/hour: 225.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudupeneus prayensis	37.62	2257	16.69	
Trichiurus lepturus	30.94	75	13.72	
Raja miraletus	21.02	33	9.32	
Rhinobatos albomaculatus	20.33	20	9.02	
Boops boops	14.34	222	6.36	
Lithognathus mormyrus	11.59	28	5.14	
Chloroscombrus chrysurus	9.43	55	4.18	
Sardinella aurita	7.86	346	3.49	
Brachydeuterus auritus	7.74	5338	3.43	
Dentex barnardi	7.41	206	3.28	107
Dasyatis margarita	6.64	4	2.95	
Trachurus trecae	6.35	206	2.81	
Sphyræna guachancho	6.19	63	2.74	
Pomadasys incisus	6.17	41	2.74	106
Selene dorsalis	5.76	35	2.55	
Pagellus bellottii	4.81	49	2.13	
S H R I M P S	4.58	37	2.03	105
Octopus vulgaris	3.24	10	1.44	
Citharus linguatula	3.05	118	1.35	
Plectorhynchus mediterraneus	2.85	4	1.26	
Sepia orbignyana	1.16	2	0.51	
Alectis alexandrinus	1.08	2	0.48	
Chelidonicichthys gabonensis	1.06	10	0.47	
Gymnura altavela	1.02	35	0.45	
Torpedo torpedo	0.53	2	0.24	
Hemicaranx bicolor	0.47	2	0.21	
Fistularia petimba	0.41	2	0.18	
Sardinella maderensis	0.39	2	0.17	
Chaetodon hoefleri	0.37	2	0.17	
Alloteuthis africana	0.28	77	0.12	
Pontinus accraensis	0.26	4	0.11	
Sepia officinalis hierredda	0.20	2	0.09	
Lagocephalus lagocephalus	0.14	4	0.06	
Monolele microstoma	0.12	8	0.05	
Chaetodon marcellae	0.08	2	0.03	
Total	225.48		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 52  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.60  
 start stop duration Lon E 13°43.24  
 TIME :09:07:02 09:38:13 31.2 (min) Purpose : 3  
 LOG : 2409.77 2411.32 1.6 Region : 4040  
 FDEPTH: 27 27 Gear cond.: 0  
 BDEPTH: 27 27 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn  
 Sorted : 107 Total catch: 351.92 Catch/hour: 677.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Rhinobatos albomaculatus	175.90	108	25.97	
Brachydeuterus auritus	73.34	1855	10.83	110
Sphyræna guachancho	61.27	114	9.05	
Pteroscion pelli	59.36	4851	8.77	
Galeoides decadactylus	54.28	1022	8.02	
Raja miraletus	38.74	58	5.72	
Ephippion guttifer	24.44	19	3.61	
Drepane africana	23.50	44	3.47	
Trachurus trecae	22.53	350	3.33	108
Pomadasy incisus	14.53	375	2.15	111
Gymnura altavela	13.26	6	1.96	
Sardinella maderensis	13.07	191	1.93	
Dasyatis margarita	11.10	13	1.64	
Sardinella aurita	10.28	254	1.52	
Selene dorsalis	10.08	908	1.49	
Pseudotolithus typus	9.70	19	1.43	
Arius parkii	8.12	19	1.20	
Lithognathus mormyrus	7.87	19	1.16	
Trichiurus lepturus	7.04	287	1.04	
Eucinostomus melanopterus	6.60	50	0.97	
Umbrina canariensis	6.47	96	0.95	109
Cynoglossus senegalensis	6.27	6	0.93	
Chloroscombrus chrysurus	6.22	64	0.92	
Pagellus bellottii	3.87	25	0.57	
Dicologlossa cuneata	3.62	69	0.53	
Cynoglossus canariensis	1.77	19	0.26	
Grammolites gruvelli	1.02	33	0.15	
Dentex barnardi	0.89	13	0.13	
Argyrosomus hololepidotus	0.69	13	0.10	
Pontinus accraensis	0.50	6	0.07	
Torpedo marmorata	0.44	13	0.07	
Torpedo marmorata	0.44	6	0.07	
Total	677.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 53  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°17.24  
 start stop duration Lon E 13°44.45  
 TIME :11:20:40 11:40:43 20.1 (min) Purpose : 3  
 LOG : 2425.25 2426.19 1.0 Region : 4040  
 FDEPTH: 22 23 Gear cond.: 0  
 BDEPTH: 22 23 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 2.8 kn  
 Sorted : 179 Total catch: 536.40 Catch/hour: 1604.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	371.93	3230	23.18	113
Galeoides decadactylus	237.34	3293	14.79	
Brachydeuterus auritus	226.57	2961	14.12	118
Trichiurus lepturus	152.54	395	9.51	
Pteroscion pelli	133.70	7017	8.33	
Trachurus trecae	73.13	736	4.56	116
Chloroscombrus chrysurus	65.95	619	4.11	
Sardinella aurita	48.45	709	3.02	112
Lithognathus mormyrus	45.76	108	2.85	
Pomadasy incisus	43.52	736	2.71	117
Sphyræna sphyræna	23.51	188	1.47	
Ilisha africana	22.88	278	1.43	
Cynoglossus canariensis	22.25	27	1.39	
Pseudupeneus prayensis	21.09	377	1.31	
Raja miraletus	12.56	27	0.78	
Pseudotolithus typus	12.11	81	0.76	114
Dasyatis margarita	11.93	9	0.74	
Sepia orbignyana	11.84	27	0.74	
MUGILIDAE	11.67	81	0.73	
Scomberomorus tritor	10.95	9	0.68	
Ephippion guttifer	9.60	9	0.60	
Pseudotolithus senegalensis	6.91	45	0.43	115
Selene dorsalis	6.82	188	0.43	
Decapterus rhonchus	5.65	72	0.35	
Pomadasy jubelini	4.49	27	0.28	
Umbrina canariensis	3.86	54	0.24	
Dicologlossa cuneata	3.41	54	0.21	
Dentex barnardi	1.62	27	0.10	
Chilomycterus spinosus mauret.	1.35	9	0.08	
Trachinus armatus	0.99	9	0.06	
Total	1604.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 54  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°15.67  
 start stop duration Lon E 13°42.17  
 TIME :12:22:10 12:54:18 32.1 (min) Purpose : 3  
 LOG : 2430.01 2431.69 1.7 Region : 4040  
 FDEPTH: 21 23 Gear cond.: 0  
 BDEPTH: 21 23 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn  
 Sorted : 55 Total catch: 54.67 Catch/hour: 102.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	20.73	151	20.30	119
Balistes capriscus	16.25	26	15.91	
Chilomycterus spinosus mauret.	9.52	39	9.33	
Trachinus armatus	8.66	26	8.49	
Octopus vulgaris	8.31	4	8.14	
G A S T R O P O D S	6.05	422	5.93	
Ephippion guttifer	5.58	2	5.47	
Aluterus heudelotii	3.55	9	3.48	
Trachinotus ovatus	3.45	9	3.38	
Pseudupeneus prayensis	3.04	19	2.98	
Lithognathus mormyrus	3.01	2	2.94	
Balistes punctatus	2.93	2	2.87	
Bothus podas africanus	2.15	22	2.10	
Rypticus saponaceus	1.70	32	1.66	
Xyrichtys novacula	1.53	13	1.50	
Scorpaena scrofa	1.44	9	1.41	
Raja miraletus	1.14	4	1.12	
Sepia orbignyana	0.77	6	0.75	
Lagocephalus laevigatus	0.65	2	0.64	
Uranoscopus cadenati	0.65	4	0.64	
Trachinocephalus myops	0.60	7	0.59	
Trachurus trecae	0.37	2	0.37	
Total	102.09		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 55  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°14.18  
 start stop duration Lon E 13°35.84  
 TIME :14:09:50 14:39:52 30.0 (min) Purpose : 3  
 LOG : 2439.47 2440.99 1.5 Region : 4040  
 FDEPTH: 152 147 Gear cond.: 0  
 BDEPTH: 152 147 Validity : 0  
 Towing dir: 0° Wire out : 410 m Speed : 3.0 kn  
 Sorted : 63 Total catch: 761.19 Catch/hour: 1520.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	868.94	593583	57.15	
Synagrops microlepis	232.89	24036	15.32	
Trichiurus lepturus	196.64	1164	12.93	
Lepidochelys olivacea	49.93	2	3.28	
Brotula barbata	49.73	86	3.27	
Parapenaeus longirostris, femal	19.55	2505	1.29	
Bembrops heterurus	18.46	198	1.21	
Dentex angolensis	17.78	90	1.17	120
Torpedo torpedo	11.86	22	0.78	
Merluccius capensis	10.69	22	0.70	122
Pterothrissus belloci	7.69	44	0.51	
Parapenaeus longirostris, male	7.25	1428	0.48	
Umbrina canariensis	6.11	10	0.40	121
Octopus vulgaris	5.71	22	0.38	
Pontinus accraensis	3.52	66	0.23	
Cynoponticus ferox	2.86	2	0.19	
Citharus linguatula	2.42	88	0.16	
Raja miraletus	2.42	44	0.16	
Sepia orbignyana	2.20	22	0.14	
Calappa pelii	1.10	22	0.07	
Monolene microstoma	0.88	22	0.06	
GOBIIDAE	0.66	44	0.04	
Trachurus trecae	0.64	2	0.04	
Illex coindetii	0.44	44	0.03	
Total	1520.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 56  
 DATE :11.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°13.04  
 start stop duration Lon E 13°37.89  
 TIME :15:34:26 15:55:17 20.9 (min) Purpose : 3  
 LOG : 2444.34 2445.42 1.1 Region : 4040  
 FDEPTH: 115 114 Gear cond.: 0  
 BDEPTH: 115 114 Validity : 0  
 Towing dir: 0° Wire out : 310 m Speed : 3.1 kn  
 Sorted : 79 Total catch: 271.32 Catch/hour: 780.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	317.70	72095	40.69	
Trichiurus lepturus	277.55	1632	35.55	
Brotula barbata	45.61	63	5.84	
Merluccius capensis	29.64	52	3.80	
Pontinus accraensis	27.45	155	3.52	
Pterothrissus belloci	21.06	155	2.70	
Dentex angolensis	14.96	78	1.92	123
Sepia orbignyana	10.19	9	1.30	
Zeus faber	9.41	43	1.21	
Raja miraletus	7.86	9	1.01	
Umbrina canariensis	7.25	20	0.93	124
Citharus linguatula	3.80	112	0.49	
Brachydeuterus auritus	2.07	17	0.27	
Sphoeroides sp.	2.07	9	0.27	
Uranoscopus cadenati	1.38	9	0.18	
Parapenaeus longirostris, femal	1.21	483	0.15	
G A S T R O P O D S	0.95	147	0.12	
Chlorophthalmus atlanticus	0.60	52	0.08	
Total	780.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 57  
 DATE :11.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°14.57  
 start stop duration Lon E 13°27.79  
 TIME :17:59:43 18:29:59 30.3 (min) Purpose : 3  
 LOG : 2458.74 2460.24 1.5 Region : 4040  
 FDEPTH: 518 514 Gear cond.: 0  
 BDEPTH: 518 514 Validity : 0  
 Towing dir: 0° Wire out : 1290 m Speed : 3.0 kn  
 Sorted : 65 Total catch: 329.05 Catch/hour: 652.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	390.74	86192	59.87	
Lamprogrammus exutus	79.83	1855	12.23	
Aristeus varidens, female	60.00	3154	9.19	
Stomias boa boa	27.87	625	4.27	
Hoplostethus cadenati	27.57	952	4.22	
Yarella blackfordi	17.45	367	2.67	
Aristeus varidens, male	7.64	1170	1.17	
Centrophorus granulosus	7.54	2	1.15	
Chaunax pictus	6.84	198	1.05	
Hymenocephalus italicus	4.56	179	0.70	
Stereomastis sp.	3.87	377	0.59	
Xenodermichthys copei	3.37	486	0.52	
Halosaurus ovenii	2.68	99	0.41	
Merluccius polli	2.58	4	0.40	
Gadella sp.	2.28	139	0.35	
Benthodesmus tenuis	1.79	89	0.27	
Gadella imberbis	1.59	69	0.24	
Triplophos hemingi	0.99	238	0.15	
Helicolenus dactylopterus	0.99	10	0.15	
Todaropsis eblanae	0.69	10	0.11	
OMMASTREPHIDAE	0.69	20	0.11	
MYCTOPHIDAE	0.50	258	0.08	
Bathyrcongiger vicinus	0.40	30	0.06	
Peristedion cataphractum	0.20	30	0.03	
Total	652.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 58  
 DATE :11.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°58.21  
 start stop duration Lon E 13°27.84  
 TIME :20:31:07 21:01:17 30.2 (min) Purpose : 3  
 LOG : 2475.59 2477.18 1.6 Region : 4040  
 FDEPTH: 372 376 Gear cond.: 0  
 BDEPTH: 372 376 Validity : 0  
 Towing dir: 0° Wire out : 930 m Speed : 3.2 kn  
 Sorted : 49 Total catch: 162.77 Catch/hour: 323.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	183.04	37000	56.55	
Merluccius polli	90.69	284	28.01	
Gadella sp.	10.50	229	3.24	
Chaunax pictus	8.87	511	2.74	
Malacocephalus laevis	8.73	3027	2.70	
Yarella blackfordi	4.91	167	1.52	
Bathyrcongiger vicinus	3.76	72	1.16	
MYCTOPHIDAE	2.70	3536	0.84	
Trichiurus lepturus	1.81	14	0.56	
Stomias boa boa	1.75	44	0.54	
Hymenocephalus italicus	1.53	20	0.47	
Hoplostethus cadenati	1.05	34	0.33	
Aristeus varidens, male	0.99	157	0.31	
Aristeus varidens, female	0.95	62	0.29	
Todarodes sagittatus	0.72	10	0.22	
Lophiodes kempi	0.42	20	0.13	
Solenocera africana	0.32	48	0.10	
Etmopterus polli	0.28	20	0.09	
Parapanaeus longirostris	0.24	34	0.07	
Gadella imberbis	0.18	10	0.06	
Ariomma bondi	0.18	4	0.06	
Dibranchius atlanticus	0.08	14	0.02	
Total	323.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 59  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°53.53  
 start stop duration Lon E 13°46.64  
 TIME :05:03:58 05:35:29 31.5 (min) Purpose : 3  
 LOG : 2516.73 2518.41 1.7 Region : 4040  
 FDEPTH: 34 33 Gear cond.: 0  
 BDEPTH: 34 33 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.2 kn  
 Sorted : 115 Total catch: 259.76 Catch/hour: 494.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	116.97	403	23.66	
Brachydeuterus auritus	103.27	2322	20.89	127
Gymnura micrura	76.97	10	15.57	
Torpedo marmorata	49.84	112	10.08	
Dicologlossa cuneata	20.04	466	4.05	
Stromateus fiatola	18.15	38	3.67	
Trichiurus lepturus	14.48	1897	2.93	
Dasyatis margarita	14.08	27	2.85	
Rhinobatos albomaculatus	9.23	4	1.87	
Pteroscion peli	8.24	586	1.67	
Cynoponticus ferrox	8.22	10	1.66	
Sphyræna guachancho	7.59	44	1.54	
Trachurus trecae	5.50	48	1.11	128
Cynoglossus canariensis	5.23	44	1.06	
Pomadasy røgeri	4.81	10	0.97	
Pagellus bellottii	4.80	4	0.97	
Sepia orbignyana	4.68	42	0.95	
Grammolites gruvelli	4.55	69	0.92	
Selene dorsalis	4.47	34	0.90	
Pseudotolithus typus	2.87	8	0.58	
Ilisha africana	2.87	21	0.58	
Argyrosomus hololepidotus	2.06	13	0.42	
Lutjanus gorensis	1.60	4	0.32	
Brotula barbata	1.16	4	0.23	
Pomadasy jubelini	1.12	4	0.23	
Chloroscombrus chrysurus	0.86	8	0.17	
Raja miraletus	0.36	4	0.07	
Octopus vulgaris	0.27	4	0.05	
Total	494.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 60  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°55.02  
 start stop duration Lon E 13°44.05  
 TIME :06:15:40 06:45:41 30.0 (min) Purpose : 3  
 LOG : 2522.57 2524.07 1.5 Region : 4040  
 FDEPTH: 50 51 Gear cond.: 0  
 BDEPTH: 50 51 Validity : 0  
 Towing dir: 0° Wire out : 145 m Speed : 3.0 kn  
 Sorted : 55 Total catch: 185.56 Catch/hour: 371.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	227.66	666	61.37	
Galeoides decadactylus	23.13	68	6.24	
Selene dorsalis	22.35	182	6.03	
Brachydeuterus auritus	18.31	720	4.94	129
Citharus linguatula	13.52	424	3.64	
Sepia orbignyana	11.30	52	3.04	
Raja miraletus	8.70	60	2.34	
Trachurus trecae	8.16	794	2.20	130
Grammolites gruvelli	7.76	128	2.09	
Pomadasy røgeri	5.78	14	1.56	
Pseudotolithus typus	3.64	6	0.98	
Pagellus bellottii	3.32	20	0.89	
Zeus faber	2.82	6	0.76	
Dicologlossa cuneata	2.60	28	0.70	
Carcharhinus signatus	2.46	2	0.66	
Gobiidae	2.02	330	0.54	
Brotula barbata	1.82	20	0.49	
Argyrosomus hololepidotus	1.16	2	0.31	
Torpedo sp.	1.00	6	0.27	
Torpedo marmorata	0.96	2	0.26	
Cynoglossus canariensis	0.82	10	0.22	
Dentex barnardi	0.78	16	0.21	
ANTENNARIIDAE	0.30	18	0.08	
Alloteuthis africana	0.22	112	0.06	
Scorpaena normani	0.20	16	0.05	
Umbrina canariensis	0.12	2	0.03	
Penaeus notialis	0.10	2	0.03	
Total	371.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 61  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°55.45  
 start stop duration Lon E 13°35.20  
 TIME :07:54:51 08:24:53 30.0 (min) Purpose : 3  
 LOG : 2533.21 2534.74 1.5 Region : 4040  
 FDEPTH: 116 115 Gear cond.: 0  
 BDEPTH: 116 115 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.1 kn  
 Sorted : 103 Total catch: 211.68 Catch/hour: 422.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	109.49	1043	25.89	
Brachydeuterus auritus	86.31	667	20.41	132
Pterothrissus belloci	52.75	392	12.47	
Dentex angolensis	32.77	208	7.75	131
Brotula barbata	27.87	32	6.61	
Uranoscopus polli	22.78	312	5.39	
Merluccius capensis	20.18	76	4.77	133
Bembrops greyi	13.35	156	3.16	
Citharus linguatula	11.55	384	2.73	
Raja miraletus	10.47	20	2.48	
Scorpaena normani	7.99	92	1.89	
Zeus faber	7.43	40	1.76	
Stromateus fiatola	3.72	4	0.88	
Alloteuthis africana	3.24	1550	0.77	
Trigla lyra	2.72	16	0.64	
Sepia orbignyana	2.56	36	0.60	
Umbrina canariensis	1.36	12	0.32	
Galeoides decadactylus	1.32	4	0.31	
Pontinus accraensis	0.96	4	0.23	
Parapanaeus longirostris, femal	0.88	180	0.21	
Illex coindetii	0.76	28	0.18	
Torpedo torpedo	0.72	4	0.17	
Lophiodes kempi	0.72	4	0.17	
Octopus vulgaris	0.52	2	0.12	
Parapanaeus longirostris, male	0.24	72	0.06	
Sepia officinalis hierredda	0.20	4	0.05	
Total	422.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 62  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°39.15  
 start stop duration Lon E 13°40.86  
 TIME :10:25:39 10:56:42 31.1 (min) Purpose : 3  
 LOG : 2551.34 2552.99 1.6 Region : 4040  
 FDEPTH: 31 29 Gear cond.: 0  
 BDEPTH: 31 29 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn  
 Sorted : 75 Total catch: 74.66 Catch/hour: 144.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	63.57	73	44.07	
Rhinobatos albomaculatus	35.56	21	24.65	
Raja miraletus	21.35	56	14.80	
Gymnura micrura	7.34	2	5.09	
Ephippion guttifer	3.48	6	2.41	
Brachydeuterus auritus	3.42	27	2.37	
Grammolites gruvelli	2.14	39	1.49	
Galeoides decadactylus	1.68	2	1.17	
Citharus linguatula	1.35	10	0.94	
Dasyatis margarita	1.22	2	0.84	
Torpedo marmorata	0.62	6	0.43	
Chilomycterus spinosus mauret.	0.58	2	0.40	
Bembrops greyi	0.52	6	0.36	
Dicologlossa hexophthalma	0.48	2	0.33	
Pterothrissus belloci	0.41	2	0.28	
Cynoglossus canariensis	0.41	2	0.17	
Sepia orbignyana	0.15	2	0.11	
Dicologlossa cuneata	0.14	6	0.09	
Total	144.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 63  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°38.85  
 start stop duration Lon E 13°37.45  
 TIME :11:39:17 12:09:27 30.2 (min) Purpose : 3  
 LOG : 2557.19 2558.74 1.6 Region : 4040  
 FDEPTH: 46 46 Gear cond.: 0  
 BDEPTH: 46 46 Validity : 0  
 Towing dir: 0° Wire out : 140 m Speed : 3.1 kn  
 Sorted : 30 Total catch: 30.32 Catch/hour: 60.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	20.89	70	34.63	
Alectis alexandrinus	10.64	10	17.65	
Rhinobatos albomaculatus	6.21	6	10.29	
Caranx crysos	3.62	4	6.00	
Sphyræna guachancho	3.16	4	5.24	
Alloteuthis africana	2.71	849	4.49	
Pomadasys jubelini	2.45	2	4.06	
Lagocephalus lagocephalus	2.41	4	3.99	
Grammophilites gruvelli	1.99	40	3.30	
Citharus linguatula	1.65	40	2.74	
Saurida brasiliensis	1.53	754	2.54	
Torpedo marmorata	0.66	8	1.09	
Chloroscombus chrysurus	0.54	2	0.89	
Dicologlossa hexopthalma	0.48	2	0.79	
Dicologlossa cuneata	0.44	6	0.73	
Trichiurus lepturus	0.38	2	0.63	
Brachydeuterus auritus	0.18	99	0.30	
Sepia orbignyana	0.18	4	0.30	
Torpedo torpedo	0.08	6	0.13	
Penaeus notialis	0.06	2	0.10	
Trachurus trecae	0.04	18	0.07	
Calappa pelii	0.02	2	0.03	
GOBIIDAE	0.02	12	0.03	
Total	60.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 64  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°45.23  
 start stop duration Lon E 13°30.62  
 TIME :13:31:35 14:01:35 30.0 (min) Purpose : 3  
 LOG : 2568.84 2570.34 1.5 Region : 4040  
 FDEPTH: 91 100 Gear cond.: 0  
 BDEPTH: 91 100 Validity : 0  
 Towing dir: 0° Wire out : 0 m Speed : 3.0 kn  
 Sorted : 80 Total catch: 216.04 Catch/hour: 432.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	230.36	1918	53.31	136
Citharus linguatula	44.46	816	10.29	
Raja miraletus	28.08	42	6.50	
Dentex angolensis	19.66	140	4.55	135
Alloteuthis africana	17.94	7258	4.15	
Pontinus accraensis	14.30	166	3.31	
Pagellus bellottii	11.38	78	2.63	134
Uranoscopus cadenati	10.66	32	2.47	
Zeus faber	9.30	32	2.15	
Squatina oculata	7.20	2	1.67	
Dentex barnardi	6.00	16	1.39	
Octopus vulgaris	5.88	6	1.36	
Sphoeroides pachgaster	4.32	10	1.00	
Scorpaena stephanica	4.26	6	0.99	
Sepia orbignyana	3.84	20	0.89	
Torpedo torpedo	3.64	6	0.84	
Brotula barbata	2.86	4	0.66	
Branchiostegus semifasciatus *	2.32	2	0.54	
Lepidotrigla carolae	2.08	32	0.48	
Fistularia petimba	1.96	2	0.45	
Cynoglossus canariensis	0.68	6	0.16	
Peristedion cataphractum	0.32	6	0.07	
Trachurus trecae	0.26	6	0.06	
Saurida brasiliensis	0.26	62	0.06	
Parapenaeus longirostris	0.06	10	0.01	
Total	432.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 65  
 DATE :12.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°46.21  
 start stop duration Lon E 13°23.27  
 TIME :15:35:02 16:05:41 30.7 (min) Purpose : 3  
 LOG : 2581.28 2582.86 1.6 Region : 4040  
 FDEPTH: 149 153 Gear cond.: 0  
 BDEPTH: 149 153 Validity : 0  
 Towing dir: 0° Wire out : 420 m Speed : 3.1 kn  
 Sorted : 91 Total catch: 90.67 Catch/hour: 177.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	42.37	231	23.88	137
Trichiurus lepturus	32.19	145	18.14	
Brotula barbata	21.04	35	11.86	
Bembrops greyi	14.58	184	8.22	
Pterothrissus belloci	10.96	70	6.18	
Zeus faber	10.76	43	6.07	
Citharus linguatula	9.20	282	5.18	
Illex coindetii	8.26	256	4.65	
Raja miraletus	6.73	10	3.79	
Sepia orbignyana	5.97	55	3.36	
Lagocephalus laevigatus	4.32	10	2.44	
Trigla lyra	3.27	23	1.84	
Brachydeuterus auritus	1.43	12	0.81	
Dentex macrophthalmus	1.25	12	0.71	
Parapenaeus longirostris, femal	0.98	521	0.55	
Bembrops heterurus	0.90	264	0.51	
Scorpaena normani	0.55	6	0.31	
Umbria canariensis	0.53	2	0.30	
Bathyrcongus vicinus	0.39	2	0.22	
Uranoscopus polli	0.37	4	0.21	
Peristedion cataphractum	0.35	12	0.20	
Calappa pelii	0.35	10	0.20	
Gadella imberbis	0.27	8	0.15	
Miracorvina angolensis	0.22	2	0.12	
Serranus accraensis	0.06	4	0.03	
Parapenaeus longirostris, male	0.06	35	0.03	
Synagrops microlepis	0.04	6	0.02	
Saurida brasiliensis	0.02	2	0.01	
GOBIIDAE	0.02	2	0.01	
Total	177.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 66  
 DATE :12.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°48.19  
 start stop duration Lon E 13°19.82  
 TIME :17:26:56 17:57:15 30.3 (min) Purpose : 3  
 LOG : 2589.69 2591.26 1.6 Region : 4040  
 FDEPTH: 321 310 Gear cond.: 0  
 BDEPTH: 321 310 Validity : 0  
 Towing dir: 0° Wire out : 830 m Speed : 3.1 kn  
 Sorted : 91 Total catch: 392.40 Catch/hour: 776.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	523.32	10747	67.39	
Merluccius polli	184.22	962	23.72	138
Synagrops microlepis	28.50	1395	3.67	
Gadella sp.	11.48	129	1.48	
Scorpaena normani	10.03	119	1.29	
Parapenaeus longirostris, femal	8.59	1073	1.11	
Gadella imberbis	5.60	784	0.72	
MYCTOPHIDAE	2.30	1480	0.30	
Malacocephalus occidentalis	1.01	8	0.13	
Nezumia aequalis	0.59	8	0.08	
Parapenaeus longirostris, male	0.49	67	0.06	
Hymenocephalus italicus	0.24	263	0.03	
Solenocera africana	0.08	8	0.01	
Dibranchius atlanticus	0.08	44	0.01	
Total	776.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 67  
 DATE :12.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°48.90  
 start stop duration Lon E 13°16.36  
 TIME :19:18:22 19:48:26 30.1 (min) Purpose : 3  
 LOG : 2597.48 2598.98 1.5 Region : 4040  
 FDEPTH: 490 471 Gear cond.: 0  
 BDEPTH: 490 471 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 3.0 kn  
 Sorted : 49 Total catch: 171.33 Catch/hour: 341.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	240.24	76019	70.27	
Hoplostethus cadenati	22.77	790	6.66	
Stomias boa boa	21.93	483	6.41	
Yarellia blackfordi	20.89	601	6.11	
Gadella sp.	13.35	475	3.90	
Aristeus varidens, female	7.62	371	2.23	
Chlorophthalmus atlanticus	3.97	84	1.16	
Xenodermichthys copei	2.31	204	0.68	
Aristeus varidens, male	1.62	50	0.47	
Malacocephalus laevis	1.26	14	0.37	
Solenocera africana	1.20	8	0.35	
Lamprogrammus exutus	0.78	56	0.23	
Halosaurus ovenii	0.78	28	0.23	
Caelorinchus sp.	0.64	140	0.19	
OMMASTREPHIDAE	0.50	22	0.15	
Lophius vaillanti	0.50	8	0.15	
Chaunax pictus	0.42	8	0.12	
Gadella imberbis	0.36	14	0.11	
Plesiopeneus edwardsianus	0.22	14	0.06	
Stereomastis sculpta	0.14	14	0.04	
Nezumia aequalis	0.14	8	0.04	
Dibranchius atlanticus	0.08	8	0.02	
Hymenocephalus italicus	0.08	8	0.02	
Bathyrcongus vicinus	0.08	14	0.02	
Total	341.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 68  
 DATE :12.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°40.01  
 start stop duration Lon E 13°5.86  
 TIME :21:39:45 22:10:01 30.3 (min) Purpose : 3  
 LOG : 2612.20 2613.74 1.5 Region : 4040  
 FDEPTH: 736 740 Gear cond.: 0  
 BDEPTH: 736 740 Validity : 0  
 Towing dir: 0° Wire out : 1700 m Speed : 3.1 kn  
 Sorted : 54 Total catch: 53.81 Catch/hour: 106.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarellia blackfordi	17.34	527	16.26	
Stereomastis sp.	12.69	634	11.89	
Nezumia micronychodon	12.59	279	11.80	
Stomias boa boa	12.39	335	11.61	
OMMASTREPHIDAE	7.33	40	6.61	
E C H I N O D E R M A T A	5.83	8	5.46	
Nematocarcinus africanus	5.53	926	5.18	
Talismania longifilis	4.38	93	4.11	
Hoplostethus cadenati	2.97	69	2.79	
Laemonema laureysi	2.83	36	2.66	
Bathyrcongus vicinus	2.60	40	2.43	
Regalecus glesne	2.42	2	2.27	
Aristeus varidens, female	2.34	109	2.19	
Malacocephalus laevis	2.16	28	2.03	
Triplophos hemingi	1.74	214	1.64	
Monomitus metriostoma	1.49	24	1.39	
Lamprogrammus exutus	1.27	4	1.19	
Raja alba	1.19	2	1.12	
Schedophilus huttoni	0.93	2	0.87	
Holothuria sp.	0.75	2	0.71	
Dicrolene intronigra	0.75	22	0.71	
Gadella imberbis	0.69	26	0.65	
S H R I M P S	0.67	54	0.63	
MELANOSTOMIATIDAE	0.63	24	0.59	
NOTOSUDIDAE	0.61	2	0.58	
Dibranchius atlanticus	0.50	24	0.46	
Nezumia sp.	0.38	6	0.35	
NETASTOMIATIDAE	0.32	2	0.30	
Synaphobranchus kaupii	0.28	8	0.26	
Aristeus varidens, male	0.22	24	0.20	
Cubiceps gracilis	0.22	6	0.20	
Benthodesmus tenuis	0.20	4	0.19	
Lampadena pontifex	0.16	4	0.15	
MYCTOPHIDAE	0.12	10	0.11	
Cataetix laticeps	0.08	10	0.07	
CARISTIIDAE	0.06	2	0.06	
Total	106.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 69  
 DATE :13.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°38.07  
 start stop duration Lon E 13°7.95  
 TIME :00:10:33 00:41:22 30.8 (min) Purpose : 3  
 LOG : 2619.47 2621.05 1.6 Region : 4040  
 FDEPTH: 517 521 Gear cond.: 0  
 BDEPTH: 517 521 Validity : 0  
 Towing dir: 0° Wire out : 1290 m Speed : 3.1 kn  
 Sorted : 72 Total catch: 287.36 Catch/hour: 559.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	258.23	70092	46.14	
Hoplostethus cadenati	103.21	3723	18.44	
Lamprogrammus exutus	94.64	2602	16.91	
Aristeus varidens, female	22.28	1044	3.98	
Yarella blackfordi	18.31	569	3.27	
Benthodesmus tenuis	10.75	405	1.92	
Stomias boa boa	9.43	234	1.68	
Aristeus varidens, male	6.85	1044	1.22	
Merluccius polli	6.70	16	1.20	
Chlorophthalmus atlanticus	5.69	148	1.02	
Stereomastis sp.	4.67	413	0.84	
Laemonema laureysi	4.44	327	0.79	
Gadella imberbis	4.21	156	0.75	
THYSANOTEUTHIDAE	3.66	16	0.65	
Chaunax pictus	2.65	86	0.47	
Xenodermichthys copei	1.40	148	0.25	
Bathyrroconger vicinus	0.86	55	0.15	
Nemichthys scolopaceus	0.70	47	0.13	
Scopelosaurus meadi	0.55	8	0.10	
AcanthePHYRA sp.	0.31	62	0.06	
Etmopterus polli	0.08	8	0.01	
Total	559.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 70  
 DATE :13.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°36.90  
 start stop duration Lon E 13°10.26  
 TIME :01:53:11 02:23:27 30.3 (min) Purpose : 3  
 LOG : 2625.50 2627.03 1.5 Region : 4040  
 FDEPTH: 340 340 Gear cond.: 0  
 BDEPTH: 340 340 Validity : 0  
 Towing dir: 0° Wire out : 950 m Speed : 3.0 kn  
 Sorted : 58 Total catch: 355.65 Catch/hour: 704.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	307.23	19296	43.58	
Merluccius polli	299.80	1613	42.53	139
Hymenoccephalus italicus	20.71	3314	2.94	
Lophiodes kempfi	17.15	6	2.43	
Laemonema laureysi	16.89	523	2.40	
Synagrops microlepis	13.74	807	1.95	
Parapenaeus longirostris, female	8.72	1330	1.24	
Pterothrissus belloci	6.76	44	0.96	
Helicolenus dactylopterus	4.80	65	0.68	
Aristeus varidens, male	4.36	545	0.62	
Stereomastis sp.	1.74	240	0.25	
MYCTOPHIDAE	1.53	1177	0.22	
GALATHEIDAE *	0.87	153	0.12	
Parapenaeus longirostris, male	0.44	87	0.06	
Aristeus varidens, female	0.22	22	0.03	
Total	704.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 71  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°35.05  
 start stop duration Lon E 13°14.58  
 TIME :05:04:54 05:35:05 30.2 (min) Purpose : 3  
 LOG : 2635.49 2637.14 1.7 Region : 4040  
 FDEPTH: 131 129 Gear cond.: 0  
 BDEPTH: 131 129 Validity : 0  
 Towing dir: 0° Wire out : 390 m Speed : 3.3 kn  
 Sorted : 152 Total catch: 152.32 Catch/hour: 302.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	148.51	833	49.04	140
Trichiurus lepturus	64.31	201	21.24	
Brotula barbata	19.18	24	6.34	
Pterothrissus belloci	14.21	93	4.69	
G A S T R O P O D S	12.52	2038	4.14	
Trigla lyra	9.34	85	3.09	
Citharus linguatula	8.47	225	2.80	
Cynoponticus ferox	4.17	4	1.38	
Umbrina canariensis	3.34	6	1.10	
Zeus faber	2.33	4	0.77	
Syacium micrurum	2.27	123	0.75	
Sepia orbignyana	2.23	22	0.74	
Dentex macropthalmus	1.67	16	0.55	
Peristedion cataphractum	1.31	30	0.43	
Bembrops greyi	1.27	14	0.42	
Branchiostegus semifasciatus *	1.09	2	0.36	
Uranoscopus polli	1.05	8	0.35	
Lagocephalus laevigatus	1.03	4	0.34	
Illex coindetii	0.99	40	0.33	
Raja miraletus	0.78	2	0.26	
Boops boops	0.78	12	0.26	
Spicara alta	0.56	10	0.18	
Pontinus accraensis	0.54	2	0.18	
Pagellus bellottii	0.28	2	0.09	
Scomber japonicus	0.22	2	0.07	
Trachurus trecae	0.20	2	0.07	
Lophiodes kempfi	0.16	4	0.05	
Total	302.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 72  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°31.54  
 start stop duration Lon E 13°21.32  
 TIME :06:52:02 07:21:48 29.8 (min) Purpose : 3  
 LOG : 2645.87 2647.45 1.6 Region : 4040  
 FDEPTH: 94 95 Gear cond.: 0  
 BDEPTH: 94 95 Validity : 0  
 Towing dir: 0° Wire out : 285 m Speed : 3.2 kn  
 Sorted : 96 Total catch: 286.80 Catch/hour: 577.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	254.16	2109	43.99	144
Trachurus trecae	141.44	6594	24.48	142
Trigla lyra	50.11	405	8.67	
Pagellus bellottii	41.40	351	7.17	141
Raja miraletus	13.96	24	2.42	
Dentex angolensis	11.73	151	2.03	143
Lagocephalus laevigatus	10.52	42	1.82	
Uranoscopus polli	8.28	30	1.43	
Citharus linguatula	8.04	514	1.39	
Sepia orbignyana	7.43	48	1.29	
Torpedo torpedo	5.80	6	1.00	
Alloteuthis africana	5.74	2146	0.99	
Scorpaena normani	4.96	60	0.86	
Zeus faber	4.47	12	0.77	
G A S T R O P O D S	2.12	187	0.37	
Saurida brasiliensis	1.81	375	0.31	
Illex coindetii	1.45	97	0.25	
Peristedion cataphractum	1.27	42	0.22	
Octopus vulgaris	0.97	6	0.17	
Pterothrissus belloci	0.97	6	0.17	
Pseudupeneus prayensis	0.79	6	0.14	
Sardinella aurita	0.24	6	0.04	
Starfish	0.18	6	0.03	
Total	577.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 73  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°28.44  
 start stop duration Lon E 13°27.72  
 TIME :08:27:46 08:57:16 29.5 (min) Purpose : 3  
 LOG : 2655.44 2656.96 1.5 Region : 4040  
 FDEPTH: 50 47 Gear cond.: 0  
 BDEPTH: 50 47 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn  
 Sorted : 248 Total catch: 557.62 Catch/hour: 1134.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasyus peroteti	999.72	1456	88.15	146
Pagellus bellottii	29.59	197	2.61	145
G A S T R O P O D S	21.97	344	1.94	
Raja miraletus	21.46	51	1.89	
Plectorhinchus mediterraneus	10.47	18	0.92	
Pseudupeneus prayensis	9.15	69	0.81	
Alectis alexandrinus	7.95	10	0.70	
Dentex barnardi	5.90	33	0.52	
Pomadasyus incisus	4.62	22	0.41	
Chilomycterus spinosus mauret.	4.43	18	0.39	
Seriola carpenteri	4.03	4	0.36	
Fistularia petimba	2.50	10	0.22	
Balistes capricus	2.20	4	0.19	
Alloteuthis africana	2.01	618	0.18	
Sparus pagrus pagrus *	1.91	4	0.17	
Grammolites gruvelli	1.28	37	0.11	
Boops boops	1.14	28	0.10	
Syacium micrurum	1.10	10	0.10	
Citharus linguatula	0.96	33	0.08	
Saurida brasiliensis	0.67	175	0.06	
Peristedion cataphractum	0.41	4	0.04	
Lophiodes kempfi	0.37	18	0.03	
Monolene microstoma	0.31	14	0.03	
Total	1134.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 74  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°27.01  
 start stop duration Lon E 13°31.20  
 TIME :09:44:40 10:15:43 31.0 (min) Purpose : 3  
 LOG : 2661.66 2663.24 1.6 Region : 4040  
 FDEPTH: 27 28 Gear cond.: 0  
 BDEPTH: 27 28 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn  
 Sorted : 71 Total catch: 70.72 Catch/hour: 136.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Drepane africana	51.32	91	37.54	
Alectis alexandrinus	44.46	46	32.52	
G A S T R O P O D S	10.63	180	7.78	
Ephippion guttifer	8.47	4	6.19	
Raja miraletus	4.10	8	3.00	
Dasyatis margarita	3.83	2	2.80	
Arius parkii	3.79	6	2.77	
Syacium micrurum	2.84	23	2.08	
Cynoglossus canariensis	1.80	6	1.32	
Sphyraena guachancho	1.55	2	1.13	
Pseudotolithus typus	1.10	2	0.81	
Rhinobatos albomaculatus	1.06	4	0.78	
Euclinostomus melanopterus	0.50	4	0.37	
Grammolites gruvelli	0.43	12	0.31	
Brachydeuterus auritus	0.37	112	0.27	
Sepia orbignyana	0.27	2	0.20	
ANTENNARIIDAE	0.14	4	0.10	
Squilla mantis	0.06	2	0.04	
Total	136.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 75  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°15.51  
 start stop duration Purpose : 3  
 LOG : 2674.76 2676.32 1.6 Region : 4040  
 FDEPTH: 32 32 Gear cond.: 0  
 BDEPTH: 32 32 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn  
 Sorted : 126 Total catch: 125.68 Catch/hour: 249.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudolithus senegalensis	71.28	87	28.56	147
Stromateus fiatola	29.68	73	11.90	
Raja miraletus	29.09	40	11.66	
Galeoides decadactylus	23.23	58	9.31	
Ephippion guttifer	21.74	10	8.71	
Pseudolithus typus	21.34	28	8.55	149
Trichiurus lepturus	6.33	16	2.54	
G A S T R O P O D S	5.58	85	2.24	
Brachydeuterus auritus	5.16	294	2.07	
Cynoglossus canariensis	3.75	10	1.50	
Sphyræna sphyraena	3.57	6	1.43	
Gymnura micrura	3.02	2	1.21	
Dicologlossa cuneata	2.70	40	1.08	
Rhinobatos albomaculatus	2.62	2	1.05	
Rhizoprionodon acutus	2.32	2	0.93	
Dasyatis marmorata	2.10	2	0.84	
Torpedo marmorata	1.83	12	0.73	
Cynoponticus ferox	1.77	2	0.71	
Citharus linguatula	1.63	10	0.65	
Sepia orbignyana	1.43	8	0.57	
Grammolites gruvelli	1.41	28	0.56	
Atractoscion aequidens	1.37	6	0.55	
Scomberomorus tritor	1.29	2	0.52	
Lagocephalus laevigatus	1.23	2	0.49	
Alectis alexandrinus	0.83	2	0.33	
Calappa rubroguttata	0.75	6	0.30	
Pomadasy jubelini	0.71	2	0.29	
E C H I N O D E R M A T A	0.64	8	0.25	
Sardinella maderensis	0.46	2	0.18	
Eucinostomus melanopterus	0.24	2	0.10	
Alloteuthis africana	0.14	32	0.06	
Engraulis encrasicolus	0.08	8	0.03	
Penaeus notialis	0.08	50	0.03	
Chilomycterus spinosus mauret.	0.08	2	0.03	
ANTHIDAE	0.04	4	0.02	
Total	249.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 76  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°13.04  
 start stop duration Purpose : 3  
 LOG : 2680.95 2682.47 1.5 Region : 4040  
 FDEPTH: 48 47 Gear cond.: 0  
 BDEPTH: 48 47 Validity : 0  
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn  
 Sorted : 0 Total catch: 33.49 Catch/hour: 66.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ephippion guttifer	29.28	12	43.74	
Caranx crysos	9.99	14	14.93	
Raja miraletus	9.71	16	14.51	
Trichiurus lepturus	4.08	8	6.09	
Rhinobatos albomaculatus	2.64	2	3.94	
G A S T R O P O D S	2.04	38	3.05	
Sphyræna sphyraena	1.34	4	2.00	
Pagellus bellottii	1.34	6	2.00	
Citharus linguatula	1.28	22	1.91	
Scomberomorus tritor	1.24	2	1.85	
Torpedo marmorata	0.74	8	1.10	
Cynoglossus canariensis	0.60	2	0.90	
Torpedo torpedo	0.56	14	0.84	
Galeoides decadactylus	0.56	2	0.84	
Dicologlossa cuneata	0.40	4	0.60	
Grammolites gruvelli	0.40	16	0.60	
Alloteuthis africana	0.38	94	0.57	
Sepia officinalis hierredda	0.32	4	0.48	
Penaeus notialis	0.04	2	0.06	
Total	66.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 77  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°13.38  
 start stop duration Purpose : 3  
 LOG : 2686.52 2688.14 1.6 Region : 4040  
 FDEPTH: 67 69 Gear cond.: 0  
 BDEPTH: 67 69 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.1 kn  
 Sorted : 83 Total catch: 82.83 Catch/hour: 156.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Epinephelus aeneus	34.44	6	22.03	
Lepidotrigla cadmani	28.69	226	18.35	
Raja miraletus	16.99	62	10.87	
Squatina oculata	13.12	4	8.39	
Alloteuthis africana	7.19	1921	4.60	
Pomadasy incisus	6.49	28	4.15	
Trichiurus lepturus	6.23	11	3.98	
Dentex angolensis	6.13	117	3.92	150
Pagellus bellottii	5.53	51	3.54	
Zeus faber	4.62	8	2.96	
Octopus vulgaris	4.17	4	2.67	
Citharus linguatula	4.00	92	2.56	
Saurida brasiliensis	3.40	704	2.17	
Grammolites gruvelli	2.40	49	1.53	
Sepia orbignyana	2.09	23	1.34	
Rhinobatos albomaculatus	2.00	2	1.28	
Serranus accraensis	1.59	28	1.01	
Fistularia petimba	1.47	8	0.94	
Torpedo torpedo	1.34	6	0.86	
Caranx crysos	1.17	2	0.75	
Lagocephalus laevigatus	1.11	2	0.71	
Galeoides decadactylus	0.79	4	0.51	
Pseudupeneus prayensis	0.42	4	0.27	
Brotula barbata	0.28	2	0.18	
G A S T R O P O D S	0.23	15	0.14	
Chaetodon hoefleri	0.19	2	0.12	
Dicologlossa hexophthalma	0.17	2	0.11	
Arnoglossus imperialis	0.08	6	0.05	
Total	156.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 78  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°22.10  
 start stop duration Purpose : 3  
 LOG : 2704.69 2706.36 1.7 Region : 4040  
 FDEPTH: 175 172 Gear cond.: 0  
 BDEPTH: 175 172 Validity : 0  
 Towing dir: 0° Wire out : 450 m Speed : 3.2 kn  
 Sorted : 122 Total catch: 121.84 Catch/hour: 233.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	104.24	14893	44.69	
Dentex angolensis	24.41	146	10.46	152
Pterothrissus belloci	17.23	124	7.39	
Trichiurus lepturus	12.16	69	5.21	
Zenopsis conchifer	11.10	21	4.76	
Spicara alta	10.91	48	4.68	
Illex coindetii	7.47	163	3.20	
Uranoscopus cadenati	7.33	25	3.14	
Brotula barbata	6.60	8	2.83	
Raja miraletus	5.48	13	2.35	
Citharus linguatula	5.19	77	2.22	
Heptranchias perlo	5.07	2	2.17	
Dentex macrophthalmus	5.02	34	2.15	153
Euthynnus alletteratus	3.39	2	1.45	
Helicolenus dactylopterus	2.13	6	0.91	
Lagocephalus laevigatus	2.09	2	0.89	
Malacocephalus occidentalis	1.63	19	0.70	
Merluccius capensis	0.90	2	0.39	
Sepia orbignyana	0.27	2	0.11	
Scomber japonicus	0.25	2	0.11	
Squilla mantis	0.23	8	0.10	
Bembrops greyi	0.10	2	0.04	
Parapenaeus longirostris	0.08	25	0.03	
Total	233.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 79  
 DATE :13.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°25.35  
 start stop duration Lon E 12°55.59  
 TIME :19:08:18 19:23:18 15.0 (min) Purpose : 3  
 LOG : 2718.52 2719.67 1.1 Region : 4040  
 FDEPTH: 616 603 Gear cond.: 0  
 BDEPTH: 616 603 Validity : 0  
 Towing dir: 0° Wire out : 1430 m Speed : 1.9 kn  
 Sorted : 87 Total catch: 86.85 Catch/hour: 347.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	182.60	37596	52.56	
Lamprogrammus exultus	32.60	328	9.38	
Yarella corythaeola	28.00	624	8.06	
Stomias boa boa	26.88	724	7.74	
Hoplostethus cadenati	21.00	736	6.04	
Centrophorus granulosus	18.40	8	5.30	
Stereomastis sp.	9.32	432	2.68	
Aristeus varidens, female	4.00	188	1.15	
Gadella imberbis	3.60	176	1.04	
OMMASTREPHIDAE	2.80	8	0.81	
Xenodermichthys copei	2.48	228	0.71	
Centrophorus squamosus	2.44	12	0.70	
Chlorophthalmus atlanticus	1.72	44	0.50	
Triplophos hemingi	1.44	208	0.41	
Scopelosaurus meadi	1.36	40	0.39	
Chaceon maritae	0.88	4	0.25	
Benthodesmus tenuis	0.88	36	0.25	
Schedophilus huttoni	0.80	4	0.23	
THYSANOTEUTHIDAE	0.60	4	0.17	
Malacocephalus laevis	0.60	16	0.17	
CARISTIIDAE	0.60	36	0.17	
Aristeus varidens, male	0.60	88	0.17	
Nemichthys scolopaceus	0.56	40	0.16	
Cubiceps gracilis	0.52	24	0.15	
TRACHIPTERIDAE	0.48	4	0.14	
S H R I M P S	0.48	164	0.14	
Laemonema laureysi	0.40	4	0.12	
Etmopterus spinax	0.40	4	0.12	
Conger conger	0.32	4	0.09	
Chaunax pictus	0.32	8	0.09	
Hymenocephalus italicus	0.20	12	0.06	
Halosaurus ovenii	0.12	8	0.03	
Total	347.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 80  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°6.73  
 start stop duration Lon E 12°53.34  
 TIME :02:25:48 02:56:02 30.2 (min) Purpose : 3  
 LOG : 2740.23 2741.72 1.5 Region : 4040  
 FDEPTH: 310 304 Gear cond.: 0  
 BDEPTH: 310 304 Validity : 0  
 Towing dir: 0° Wire out : 190 m Speed : 3.0 kn  
 Sorted : 90 Total catch: 298.02 Catch/hour: 591.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	279.80	5266	47.32	
Merluccius polli	150.97	806	25.53	
Gephyroberyx darwini	51.19	85	8.66	
Laemonema laureysi	30.26	377	5.12	
Helicolenus dactylopterus	25.56	244	4.32	
Pentheroscion mbizi	24.11	6	4.08	
Pterothrissus belloci	10.16	65	1.72	
Zenopsis conchifer	5.54	14	0.94	
Parapanaeus longirostris, femal	4.82	681	0.82	
Gadella imberbis	3.29	133	0.56	
Malacocephalus laevis	2.90	20	0.49	
MYCTOPHIDAE	1.45	1415	0.24	
Synagrops microlepis	0.52	26	0.09	
Parapanaeus longirostris, male	0.32	54	0.05	
Cyrtopsis roseus	0.26	6	0.04	
Nemichthys scolopaceus	0.18	6	0.03	
Total	591.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 81  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°6.20  
 start stop duration Lon E 13°0.14  
 TIME :04:42:11 05:12:14 30.0 (min) Purpose : 3  
 LOG : 2751.50 2752.98 1.5 Region : 4040  
 FDEPTH: 105 107 Gear cond.: 0  
 BDEPTH: 105 107 Validity : 0  
 Towing dir: 0° Wire out : 285 m Speed : 3.0 kn  
 Sorted : 99 Total catch: 160.98 Catch/hour: 321.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	34.19	633	10.63	
Scorpaena normani	33.56	411	10.44	
Pagellus bellottii	31.96	330	9.94	155
Lagocephalus laevigatus	31.00	74	9.64	
Dentex angolensis	29.56	453	9.19	154
Trachurus trecae	29.40	883	9.14	156
Saurida brasiliensis	19.01	4087	5.91	
Dentex congoensis	18.06	358	5.62	157
Citharus linguatula	16.78	997	5.22	
Zeus faber	16.48	42	5.12	
G A S T R O P O D S	9.99	841	3.11	
Sepia orbignyana	9.49	102	2.95	
Torpedo torpedo	9.33	20	2.90	
Uranoscopus cadenati	6.07	36	1.89	
Raja miraletus	5.67	10	1.76	
Illex coindetii	4.71	138	1.47	
Squatina oculata	4.23	4	1.32	
Fistularia petimba	3.85	6	1.20	
Octopus vulgaris	3.00	4	0.93	
Ariomma bondi	1.66	22	0.52	
Brachydeuterus auritus	1.04	10	0.32	
Alloteuthis africana	0.56	188	0.17	
Dicologlossa hexopthalma	0.54	10	0.17	
Trichiurus lepturus	0.40	4	0.12	
Umbrina canariensis	0.38	4	0.12	
Monolene microstoma	0.32	42	0.10	
Bathyrucogaster vicinus	0.18	4	0.06	
Spicara alta	0.08	6	0.02	
Conger conger	0.04	4	0.01	
Total	321.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 82  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°1.63  
 start stop duration Lon E 13°4.83  
 TIME :06:12:48 06:42:50 30.0 (min) Purpose : 3  
 LOG : 2760.19 2761.67 1.5 Region : 4040  
 FDEPTH: 85 85 Gear cond.: 0  
 BDEPTH: 85 85 Validity : 0  
 Towing dir: 0° Wire out : 240 m Speed : 3.0 kn  
 Sorted : 62 Total catch: 137.03 Catch/hour: 273.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	75.15	740	27.44	
Pseudupeneus prayensis	44.53	420	16.26	
Raja miraletus	18.75	44	6.85	
Squatina oculata	16.39	4	5.98	
Zeus faber	14.67	40	5.36	
Trichiurus lepturus	14.23	24	5.20	
Citharus linguatula	12.91	592	4.71	
Sea urchins (strong spines)	12.79	1027	4.67	
Lagocephalus laevigatus	12.19	12	4.45	
Octopus vulgaris	9.49	4	3.47	
Pagellus bellottii	8.79	136	3.21	158
Alloteuthis africana	6.12	3478	2.23	
Trachurus trecae	5.12	192	1.87	159
Dentex barnardi	4.84	4	1.77	
Saurida brasiliensis	3.04	472	1.11	
Sepia orbignyana	3.04	48	1.11	
Torpedo torpedo	2.96	8	1.08	
Grammolites gruvelli	2.40	44	0.88	
Uranoscopus cadenati	1.80	8	0.66	
Illex coindetii	1.60	44	0.58	
Dentex congoensis	1.12	32	0.41	
Scorpaena normani	0.88	8	0.32	
Dentex angolensis	0.52	12	0.19	
Monolene microstoma	0.36	28	0.13	
Lophius sp.	0.12	4	0.04	
Lutjanus sp.	0.08	4	0.03	
Total	273.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 83  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°0.16  
 start stop duration Lon E 13°9.63  
 TIME :07:31:23 08:01:21 30.0 (min) Purpose : 3  
 LOG : 2767.16 2768.68 1.5 Region : 4040  
 FDEPTH: 60 59 Gear cond.: 0  
 BDEPTH: 60 59 Validity : 0  
 Towing dir: 0° Wire out : 165 m Speed : 3.0 kn  
 Sorted : 67 Total catch: 66.93 Catch/hour: 133.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	24.62	208	18.38	
Pagellus bellottii	21.92	164	16.36	160
Pseudupeneus prayensis	19.12	158	14.27	
Raja miraletus	17.72	40	13.22	
Sepia orbignyana	11.21	26	8.37	
Pomadasy inciscus	10.31	46	7.69	162
Alloteuthis africana	4.66	1483	3.48	
Octopus vulgaris	4.14	4	3.09	
Grammolites gruvelli	3.90	86	2.91	
Lagocephalus laevigatus	3.86	8	2.88	
Fistularia petimba	2.24	6	1.67	
Torpedo torpedo	2.16	6	1.61	
Lutjanus sp.	2.06	28	1.54	
Chilomycterus spinosus mauret.	1.12	4	0.84	
Priacanthus arenatus	1.10	2	0.82	
Dentex angolensis	0.76	42	0.57	161
Scorpaena stephanica	0.72	14	0.54	
Pomadasy rogeri	0.62	2	0.46	
Citharus linguatula	0.52	52	0.39	
Vanstraelenia chirophthalmus	0.44	2	0.33	
Brachydeuterus auritus	0.32	2	0.24	
Monolene microstoma	0.20	28	0.15	
Saurida brasiliensis	0.20	4	0.15	
MAJIDAE	0.02	2	0.01	
Calappa pelii	0.02	2	0.01	
Total	133.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 84  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°0.03  
 start stop duration Lon E 13°13.15  
 TIME :08:46:34 09:16:36 30.0 (min) Purpose : 3  
 LOG : 2773.27 2774.80 1.5 Region : 4040  
 FDEPTH: 33 35 Gear cond.: 0  
 BDEPTH: 33 35 Validity : 0  
 Towing dir: 0° Wire out : 115 m Speed : 3.1 kn  
 Sorted : 97 Total catch: 96.81 Catch/hour: 193.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy rogeri	122.84	262	63.53	171
Raja miraletus	13.88	28	7.18	
Ephippion guttifer	13.38	8	6.92	
Rhinobatos albomaculatus	12.98	6	6.71	
Syacium micrurum	6.99	54	3.62	
Grammolites gruvelli	4.79	54	2.48	
Cynoglossus cadenati	3.56	18	1.84	
Octopus vulgaris	3.50	2	1.81	
Paranx crysos	2.96	4	1.53	
Pomadasy jubelini	1.96	2	1.01	
Torpedo torpedo	1.74	20	0.90	
Dicologlossa cuneata	1.26	12	0.65	
Pomadasy inciscus	1.10	6	0.57	
Pagellus bellottii	0.84	6	0.43	
Trigla lyra	0.62	2	0.32	
Sepia orbignyana	0.44	4	0.23	
Calappa sp.	0.26	2	0.13	
Citharus linguatula	0.24	8	0.12	
Lutjanus sp.	0.04	2	0.02	
Total	193.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 85  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°48.44  
 start stop duration Lon E 13°1.06  
 TIME :10:52:22 11:22:22 30.0 (min) Purpose : 3  
 LOG : 2790.13 2791.75 1.6 Region : 4040  
 FDEPTH: 94 95 Gear cond.: 0  
 BDEPTH: 94 95 Validity : 0  
 Towing dir: 0° Wire out : 275 m Speed : 3.2 kn  
 Sorted : 141 Total catch: 140.81 Catch/hour: 281.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	94.25	1112	33.46	164
Pagellus bellottii	51.42	288	18.25	163
Raja miraletus	32.21	58	11.43	
Dentex barnardi	29.11	78	10.33	172
E C H I N O D E R M A T A	14.50	2015	5.15	
Citharus linguatula	13.40	346	4.76	
Zeus faber	8.20	18	2.91	
Brotula barbata	7.86	6	2.79	
Uranoscopus polli	6.28	30	2.23	
Chelidonichthys capensis	5.88	34	2.09	
Trigla lyra	4.12	40	1.46	
Alloteuthis africana	2.60	1114	0.92	
Sepia orbignyana	2.38	22	0.85	
Pomadasy rogeri	1.94	4	0.69	
Sphaeroides sp.	1.82	2	0.65	
Chaetodon hoefleri	1.22	6	0.43	
Dentex congoensis	0.94	32	0.33	173
Fistularia petimba	0.82	2	0.29	
Lutjanus sp.	0.72	4	0.26	
Lophiodes sp.	0.52	2	0.18	
Illex coindetii	0.44	6	0.16	
Saurida brasiliensis	0.28	70	0.10	
Arnoglossus imperialis	0.28	18	0.10	
Grammoplites gruvelli	0.18	4	0.06	
Scorpaena normani	0.12	2	0.04	
Trachurus trecae	0.06	2	0.02	
Antennarius occidentalis	0.06	2	0.02	
Anthias anthias	0.04	2	0.01	
Torpedo nobiliana	0.02	2	0.01	
Torpedo torpedo	0.02	2	0.01	
Total	281.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 86  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°43.97  
 start stop duration Lon E 13°9.86  
 TIME :12:49:27 13:15:05 25.6 (min) Purpose : 3  
 LOG : 2802.88 2804.34 1.5 Region : 4040  
 FDEPTH: 31 31 Gear cond.: 0  
 BDEPTH: 31 31 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.4 kn  
 Sorted : 127 Total catch: 2516.51 Catch/hour: 5891.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	447.85	41665	76.01	
Pseudupeneus prayensis	342.14	2498	5.81	
Pagellus bellottii	284.34	2683	4.83	165
Decapterus rhonchus	256.60	4623	4.36	
Dentex barnardi	132.69	602	2.25	168
Dasyatis marmorata	103.10	94	1.75	
Balistes caprisicus	91.09	138	1.55	
Pomadasy incisus	80.44	370	1.37	167
Trachurus trecae	35.14	279	0.60	166
Epinephelus aeneus	26.57	2	0.45	
Chilomycterus spinosus mauret.	21.72	47	0.37	
Euclinostomus melanopterus	12.95	138	0.22	
Scomber japonicus	8.78	47	0.15	
Lagocephalus laevigatus	8.31	47	0.14	
Grammoplites gruvelli	5.55	138	0.09	
Rhinobatos albomaculatus	3.91	2	0.07	
Total	5891.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 87  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°27.42  
 start stop duration Lon E 13°4.67  
 TIME :14:52:07 15:11:37 19.5 (min) Purpose : 3  
 LOG : 2820.20 2821.28 1.1 Region : 4040  
 FDEPTH: 25 23 Gear cond.: 0  
 BDEPTH: 25 23 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.3 kn  
 Sorted : 275 Total catch: 274.70 Catch/hour: 845.23

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	314.00	335	37.15	
Alectis alexandrinus	153.38	277	18.15	
Pomadasy peroteti	140.00	148	16.56	
Pagrus caeruleostictus	128.15	243	15.16	174
Rypticus saponaceus	12.18	191	1.44	
Aluterus heudelotii	11.48	18	1.36	
Bodianus speciosus	8.68	6	1.03	
Lithognathus mormyrus	8.22	12	0.97	
Raja miraletus	7.82	12	0.92	
Scomberomorus tritor	7.75	6	0.92	
Balistes punctatus	6.62	6	0.78	
Pagellus bellottii	6.40	15	0.76	175
Panulirus regius	6.15	6	0.73	
Chaetodon hoefleri	5.17	43	0.61	
Acanthurus monroviae	4.86	6	0.58	
Epinephelus aeneus	4.71	3	0.56	
G A S T R O P O D S	3.72	34	0.44	
Caranx senegalus	2.77	3	0.33	
Fistularia petimba	2.55	6	0.30	
Dasyatis marmorata	2.22	3	0.26	
Scorpaena angolensis	2.12	25	0.25	
Balistes caprisicus	2.06	3	0.24	
Chilomycterus spinosus mauret.	1.78	9	0.21	
Bothus podas africanus	1.26	9	0.15	
Sepia orbignyana	0.71	6	0.08	
Aluterus sp.	0.31	3	0.04	
Citharus linguatula	0.06	3	0.01	
Total	845.14		99.99	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 88  
 DATE :14.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°29.10  
 start stop duration Lon E 13°0.33  
 TIME :16:14:18 16:44:16 30.0 (min) Purpose : 3  
 LOG : 2827.61 2829.30 1.7 Region : 4040  
 FDEPTH: 51 50 Gear cond.: 0  
 BDEPTH: 51 50 Validity : 0  
 Towing dir: 0° Wire out : 155 m Speed : 3.4 kn  
 Sorted : 81 Total catch: 150.01 Catch/hour: 300.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy incisus	100.42	452	33.44	170
Pagellus bellottii	96.26	573	32.05	169
Alectis alexandrinus	24.22	30	8.07	
Raja miraletus	20.82	36	6.93	
Sphyrana guachancho	20.66	70	6.88	
Pomadasy rogeri	13.91	12	4.63	
Alloteuthis africana	8.97	2751	2.99	
Sea urchins (strong spines)	7.53	1714	2.51	
Rhinobatos albomaculatus	2.52	2	0.84	
Grammoplites gruvelli	1.72	26	0.57	
Pseudupeneus prayensis	1.34	6	0.45	
Dentex barnardi	0.56	4	0.19	
Chilomycterus spinosus mauret.	0.54	4	0.18	
Citharus linguatula	0.54	22	0.18	
Lutjanus sp.	0.16	4	0.05	
Monolene microstoma	0.06	6	0.02	
Lophius sp.	0.06	4	0.02	
GOBIIDAE	0.02	10	0.01	
Total	300.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 89  
 DATE :14.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°38.62  
 start stop duration Lon E 12°39.85  
 TIME :20:17:27 20:48:40 31.2 (min) Purpose : 3  
 LOG : 2855.76 2857.32 1.6 Region : 4040  
 FDEPTH: 539 534 Gear cond.: 0  
 BDEPTH: 539 534 Validity : 0  
 Towing dir: 0° Wire out : 1290 m Speed : 3.0 kn  
 Sorted : 95 Total catch: 95.26 Catch/hour: 183.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Gadella maraldi	60.15	409	32.86	
Nematocarcinus africanus	22.58	5539	12.33	
Aristeus varidens, female	18.35	0	10.03	
Lamprogrammus exutus	15.28	269	8.35	
Yarrella blackfordi	10.57	277	5.77	
Merluccius polli	9.42	13	5.14	
Stereomastis sp.	8.94	726	4.88	
Hoplostethus cadenati	6.53	133	3.57	
Stomias affinis	4.88	102	2.67	
Centrophorus granulosus	4.80	2	2.62	
Benthodesmus tenuis	3.79	111	2.07	
Aristeus varidens, male	3.23	509	1.76	
Chaunax pictus	2.15	13	1.18	
Scyliorhinus cervigoni	2.15	2	1.18	
OMMASTREPHIDAE	1.81	13	0.99	
Gadella imberbis	1.42	136	0.78	
Caelorinchus coelorhinc. polli	0.98	15	0.54	
Xenodermichthys copei	0.98	88	0.54	
Coloconger cadenati	0.60	4	0.33	
Dibranchius atlanticus	0.60	21	0.33	
Malacocephalus occidentalis	0.58	8	0.31	
Plesiopeneus edwardsianus	0.54	27	0.29	
Triplophos hemingi	0.48	71	0.26	
MYCTOPHIDAE	0.42	254	0.23	
Halosaurus ovenii	0.35	12	0.19	
Chlorophthalmus atlanticus	0.33	8	0.18	
Bathyrconger vicinus	0.29	12	0.16	
S H R I M P S	0.21	35	0.12	
Etmopterus polli	0.19	10	0.10	
Centrophorus squamosus	0.19	2	0.10	
Todaropsis eblanae	0.12	2	0.06	
Bathynectes piperitus	0.08	2	0.04	
DERICHTHYDAE	0.06	2	0.03	
Lampadena pontifex	0.04	2	0.02	
Total	183.07		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 90  
 DATE :15.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°14.64  
 start stop duration Lon E 12°46.94  
 TIME :04:52:35 05:26:28 33.9 (min) Purpose : 3  
 LOG : 2890.12 2891.92 1.8 Region : 4040  
 FDEPTH: 115 111 Gear cond.: 0  
 BDEPTH: 115 111 Validity : 0  
 Towing dir: 0° Wire out : 310 m Speed : 3.2 kn  
 Sorted : 60 Total catch: 140.22 Catch/hour: 248.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	60.14	405	24.23	176
Trigla lyra	34.91	329	14.06	
Trichiurus lepturus	31.60	46	12.73	
Cynoponticus ferox	26.82	19	10.80	
Brotula barbata	25.05	19	10.09	
Umbrina canariensis	11.68	27	4.71	177
Pterothrissus belloci	11.28	69	4.54	
Citharus linguatula	7.17	494	2.89	
G A S T R O P O D S	6.87	754	2.77	
Octopus vulgaris	6.53	7	2.63	
Lagocephalus laevigatus	5.42	5	2.18	
Uranoscopus cadenati	4.89	35	1.97	
Saurida brasiliensis	3.19	690	1.28	
Chelidonichthys gabonensis	2.76	25	1.11	
Parapenaeus longirostris	1.75	834	0.71	
Helicolenus dactylopterus	1.49	19	0.60	
Dicologlossa hexopthalma	0.96	14	0.39	
Illex coindetii	0.90	35	0.36	
Boops boops	0.74	11	0.30	
Bembrops greyi	0.69	25	0.28	
Synagrops microlepis	0.55	110	0.22	
Trachurus trecae	0.50	5	0.20	
GOBIIDAE	0.48	297	0.19	
Chaetodon hoefleri	0.44	4	0.18	
Dentex congoensis	0.37	9	0.15	
Scorpaena stephanica	0.23	4	0.09	
Bothus podas africanus	0.23	9	0.09	
Monolene microstoma	0.18	30	0.07	
Peristedion cataphractum	0.16	5	0.06	
Alloteuthis africana	0.12	48	0.05	
Sepia orbignyana	0.07	4	0.03	
Callinectes sp.	0.04	5	0.01	
Bathyroconger vicinus	0.04	4	0.01	
Total	248.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 91  
 DATE :15.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°14.09  
 start stop duration Lon E 12°53.30  
 TIME :06:33:11 07:02:41 29.5 (min) Purpose : 3  
 LOG : 2900.42 2901.93 1.5 Region : 4040  
 FDEPTH: 49 52 Gear cond.: 0  
 BDEPTH: 49 52 Validity : 0  
 Towing dir: 0° Wire out : 135 m Speed : 3.1 kn  
 Sorted : 56 Total catch: 59.44 Catch/hour: 120.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	37.03	65	30.62	
Dentex angolensis	16.58	92	13.71	178
Epinephelus aeneus	10.99	10	9.08	
Sepia orbignyana	10.30	92	8.51	
Caranx crysos	9.66	12	7.99	
Grammolites gruvelli	7.73	149	6.39	
G A S T R O P O D S	7.63	155	6.31	
Pagellus bellottii	5.57	51	4.61	179
Alloteuthis africana	3.72	1001	3.08	
Alectis alexandrinus	3.46	4	2.86	
Citharus linguatula	2.10	112	1.73	
Scorpaena stephanica	1.95	22	1.62	
Chaetodon hoefleri	1.40	8	1.16	
Illex coindetii	1.08	26	0.89	
Trachurus trecae	0.35	2	0.29	
Brachydeuterus auritus	0.31	2	0.25	
Saurida brasiliensis	0.28	65	0.24	
Trichiurus lepturus	0.26	2	0.22	
Monolene microstoma	0.20	10	0.17	
Lagocephalus laevigatus	0.12	6	0.10	
Calappa pelii	0.06	2	0.05	
MAJIDAE	0.04	4	0.03	
Trigla lyra	0.04	2	0.03	
GOBIIDAE	0.02	14	0.02	
Bothus podas africanus	0.02	4	0.02	
L O B S T E R S	0.02	4	0.02	
Total	120.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 92  
 DATE :19.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°13.40  
 start stop duration Lon E 12°42.03  
 TIME :16:55:43 17:25:22 29.7 (min) Purpose : 3  
 LOG : 2998.62 3000.09 1.5 Region : 4040  
 FDEPTH: 250 253 Gear cond.: 0  
 BDEPTH: 250 253 Validity : 0  
 Towing dir: 0° Wire out : 550 m Speed : 3.0 kn  
 Sorted : 73 Total catch: 196.66 Catch/hour: 397.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	90.15	221	22.65	190
Merluccius polli	59.64	425	14.99	191
Brotula barbata	41.89	42	10.53	
Gephyroberyx darwini	38.15	69	9.59	
Parapenaeus longirostris, femal	30.13	4407	7.57	
Synagrops microlepis	19.69	652	4.95	
Bembrops greyi	17.56	172	4.41	
Parapenaeus longirostris, male	17.10	2343	4.30	
Malacocephalus occidentalis	16.01	93	4.02	
Chlorophthalmus atlanticus	14.10	261	3.54	
Trichiurus lepturus	14.06	20	3.53	
MYCTOPHIDAE	7.83	7127	1.97	
Cynoponticus ferox	7.49	4	1.88	
Pterothrissus belloci	7.18	51	1.81	
Pontinus accraensis	3.58	26	0.90	
Uranoscopus cadenati	2.77	12	0.70	
Dentex macropthalmus	2.37	6	0.59	
Epigonus telescopus	2.06	22	0.52	
Myxtriopsis rostellatus	1.50	8	0.38	
Nezumia aequalis	1.42	45	0.36	
Sea urchins (strong spines)	1.13	6	0.28	
Monolene microstoma	0.57	20	0.14	
Calappa pelii	0.47	20	0.12	
Conger conger	0.36	6	0.09	
Illex coindetii	0.22	6	0.06	
Todarodes sagittatus	0.22	77	0.06	
Zenopsis conchifer	0.22	2	0.06	
Laemonema laureysi	0.02	2	0.01	
Parasudis fraser-bruenneri	0.02	6	0.01	
Dicrolene intronigra	0.02	2	0.01	
Peristedion cataphractum	0.02	2	0.01	
Total	397.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 93  
 DATE :20.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°5.09  
 start stop duration Lon E 12°36.67  
 TIME :04:21:51 04:51:55 30.1 (min) Purpose : 3  
 LOG : 3065.37 3066.82 1.5 Region : 4040  
 FDEPTH: 733 740 Gear cond.: 0  
 BDEPTH: 733 740 Validity : 0  
 Towing dir: 0° Wire out : 1750 m Speed : 2.9 kn  
 Sorted : 48 Total catch: 150.76 Catch/hour: 300.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	49.98	9614	16.62	
Yareella blackfordi	49.68	1341	16.52	
Nezumia aequalis	41.00	838	13.63	
Talismania longifilis	30.35	575	10.09	
Lamprogrammus exutus	22.81	60	7.58	
Stereomastix sp.	19.10	778	6.35	
Hoplostethus cadenati	14.01	299	4.66	
Aristeus varidens, female	13.47	850	4.48	
Nephropsis atlantica	7.36	174	2.45	
Bathyroconger vicinus	6.52	96	2.17	
Opisthoteuthis agassizii	4.91	6	1.63	
Tetragonurus cuvieri	4.67	12	1.55	
Lophiodes kempi	4.49	2	1.49	
Stomias boa boa	4.19	96	1.39	
OMMASTREPHIDAE	3.95	18	1.31	
Merluccius polli	3.75	4	1.25	
MYCTOPHIDAE	3.65	3687	1.21	
Aristeus varidens, male	2.10	269	0.70	
Chaceon maritae	1.90	4	0.63	
Centrophorus squamosus	1.80	4	0.60	
Halosaurus ovenii	1.50	24	0.50	
Triplophos hemingi	1.38	156	0.46	
Lampadena sp.	1.38	98	0.46	
Gadella sp.	1.26	263	0.42	
Plesiopeneus edwardsianus	1.20	132	0.40	
Dibranchius atlanticus	1.02	42	0.34	
Cruijiraja sp.	0.96	18	0.32	
Xenodermichthys copei	0.90	60	0.30	
MELANOSTOMIATIDAE	0.42	54	0.14	
Notacanthus sexspinis	0.42	6	0.14	
Gadella imberbis	0.36	12	0.12	
Malacosteus sp.	0.30	48	0.10	
Bathypterois phenax	0.06	6	0.02	
Total	300.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 94  
 DATE :20.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°6.49  
 start stop duration Lon E 12°40.42  
 TIME :07:05:26 07:35:28 30.0 (min) Purpose : 3  
 LOG : 3077.24 3078.74 1.5 Region : 4040  
 FDEPTH: 434 425 Gear cond.: 0  
 BDEPTH: 434 425 Validity : 0  
 Towing dir: 0° Wire out : 1000 m Speed : 3.0 kn  
 Sorted : 61 Total catch: 195.21 Catch/hour: 389.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	199.43	427	51.15	192
Trichiurus lepturus	36.49	224	9.36	
Nematocarcinus africanus	30.76	11780	7.89	
Hymenoccephalus italicus	26.01	3791	6.67	
Gadella imberbis	18.32	747	4.70	
Lophiodes kempii	17.68	4	4.53	
Yarella blackfordi	11.09	399	2.84	
Laemonema laureysi	9.95	76	2.55	
Aristeus varidens, female	9.81	505	2.52	
Chaunax pictus	9.39	106	2.41	
Malacocephalus laevis	4.19	34	1.08	
Aristeus varidens, male	3.60	513	0.92	
Triplophos hemingi	2.48	427	0.64	
MYCTOPHIDAE	1.96	1864	0.50	
Halosaurus ovenii	1.40	16	0.36	
Synagrops microlepis	1.14	58	0.29	
OMMASTREPHIDAE	1.02	18	0.26	
Xenodermichthys copei	0.80	252	0.20	
Stomias boa boa	0.64	16	0.16	
Dibranchius atlanticus	0.56	34	0.14	
Benthodesmus tenuis	0.52	16	0.13	
Photonectes braueri	0.50	58	0.13	
Chlorophthalmus atlanticus	0.46	20	0.12	
Caelorinchus sp.	0.42	18	0.11	
Hoplostethus cadenati	0.32	28	0.08	
Plesiopeanaeus edwardsianus	0.32	18	0.08	
Conger conger	0.28	2	0.07	
Stereomastis sp.	0.24	34	0.06	
Cruijraja sp.	0.16	2	0.04	
Total	389.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 95  
 DATE :20.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°10.52  
 start stop duration Lon E 12°56.37  
 TIME :12:23:03 12:53:09 30.1 (min) Purpose : 3  
 LOG : 3103.98 3105.28 1.3 Region : 4040  
 FDEPTH: 20 22 Gear cond.: 0  
 BDEPTH: 20 22 Validity : 0  
 Towing dir: 0° Wire out : 80 m Speed : 2.6 kn  
 Sorted : 28 Total catch: 27.96 Catch/hour: 55.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Epinephelus aeneus	26.00	2	46.67	
Alectis alexandrinus	13.35	18	23.36	
Citharus linguatula	5.02	40	9.01	
RHINOBATIDAE	2.97	4	5.33	
Rhinobatos albomaculatus	2.79	2	5.01	
Cynoglossus canariensis	1.65	10	2.97	
Raja miraletus	1.43	2	2.58	
Penaeus notialis	0.46	10	0.82	
Chilomycterus spinosus mauret.	0.46	2	0.82	
Eucinostomus melanopterus	0.40	4	0.72	
Grammolites gruvelli	0.36	8	0.64	
Dicologlossa cuneata	0.30	6	0.54	
Torpedo nobiliana	0.22	2	0.39	
Decapterus rhonchus	0.08	2	0.14	
Dicologlossa hexophthalma	0.08	2	0.14	
Pomadasys incisus	0.06	6	0.11	
ANTENNARIIDAE	0.04	2	0.07	
Calappa sp.	0.04	2	0.07	
Total	55.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 96  
 DATE :20.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°53.78  
 start stop duration Lon E 13°0.19  
 TIME :15:12:14 15:20:51 8.6 (min) Purpose : 3  
 LOG : 3123.23 3123.63 0.4 Region : 4054  
 FDEPTH: 189 194 Gear cond.: 0  
 BDEPTH: 189 194 Validity : 0  
 Towing dir: 0° Wire out : 450 m Speed : 2.8 kn  
 Sorted : 52 Total catch: 243.51 Catch/hour: 1694.97

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	448.26	45146	26.45	
Dentex angolensis	209.86	703	12.38	193
Brotula barbata	182.02	188	10.74	
Zeus faber	177.84	369	10.49	
Pterothrissus belloci	130.30	731	7.69	
Bembrops greyi	111.09	1169	6.55	
Chelidonichthys capensis	82.34	390	4.86	
Parapenaeus longirostris, female	79.42	37594	4.69	
G A S T R O P O D S	63.83	21759	3.77	
Caelorinchus coelorhincus	50.67	1267	2.99	
Parapenaeus longirostris, male	42.39	36035	2.50	
Trichiurus lepturus	41.62	1782	2.46	
Raja clavata	24.71	7	1.46	
Helicolenus dactylopterus	18.52	146	1.09	
GOBIIDAE	11.42	1803	0.67	
Merluccius polli	6.82	28	0.40	
Bassano albescens	5.36	49	0.32	
Illex coindetii	2.92	97	0.17	
B I V A L V E S	1.95	292	0.11	
Solenocera africana	1.67	369	0.10	
Dentex macrophthalms	1.25	7	0.07	
Squilla mantis	0.70	28	0.04	
Total	1694.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 97  
 DATE :20.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°52.29  
 start stop duration Lon E 12°58.22  
 TIME :16:22:51 16:53:08 30.3 (min) Purpose : 3  
 LOG : 3127.70 3129.20 1.5 Region : 4054  
 FDEPTH: 218 207 Gear cond.: 0  
 BDEPTH: 218 207 Validity : 0  
 Towing dir: 0° Wire out : 500 m Speed : 3.0 kn  
 Sorted : 118 Total catch: 457.40 Catch/hour: 906.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	244.91	761	27.02	195
Pterothrissus belloci	138.80	719	15.31	
Brotula barbata	128.60	129	14.19	
Synagrops microlepis	82.63	6753	9.12	
Dentex angolensis	77.48	321	8.55	194
MYCTOPHIDAE	76.09	70966	8.40	
Grammolites gruvelli	52.91	482	5.84	
Caelorinchus coelorhincus	33.59	921	3.71	
Zenopsis conchifer	27.70	48	3.06	
G A S T R O P O D S	10.46	4280	1.15	
Parapenaeus longirostris, female	7.97	2069	0.88	
Dicologlossa cuneata	6.18	89	0.68	
Raja alba	4.28	6	0.47	
Parapenaeus longirostris, male	3.15	1231	0.35	
Bathyrcongus vicinus	3.03	36	0.33	
Trichiurus lepturus	2.68	155	0.30	
Peristedion cataphractum	1.43	30	0.16	
Helicolenus dactylopterus	1.43	24	0.16	
Monolele microstoma	1.25	83	0.14	
Gephyroberyx darwini	0.77	6	0.09	
GOBIIDAE	0.59	59	0.07	
Gadella imberbis	0.42	18	0.05	
Total	906.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 98  
 DATE :20.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°35.13  
 start stop duration Lon E 12°49.54  
 TIME :19:44:52 20:14:59 30.1 (min) Purpose : 3  
 LOG : 3151.83 3153.25 1.4 Region : 4054  
 FDEPTH: 705 696 Gear cond.: 0  
 BDEPTH: 705 696 Validity : 0  
 Towing dir: 0° Wire out : 1425 m Speed : 2.8 kn  
 Sorted : 42 Total catch: 127.29 Catch/hour: 253.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	173.96	42797	68.58	
OMMASTREPHIDAE	12.73	54	5.02	
Stomias boa boa	11.84	114	4.67	
Triplophos hemingi	8.79	1381	3.46	
Hoplostethus cadenati	7.77	395	3.06	
Stereomastis sp.	7.71	263	3.04	
Yarella blackfordi	7.35	239	2.90	
Trichiurus lepturus	4.42	30	1.74	
Talismania longifiliis	3.41	60	1.34	
J E L Y F I S H	2.57	42	1.01	
Xenodermichthys copei	2.39	161	0.94	
MYCTOPHIDAE	1.85	3049	0.73	
Photonectes braueri	1.73	30	0.68	
Merluccius polli	1.43	2	0.57	
Gadella sp.	1.02	36	0.40	
Dibranchius atlanticus	0.78	48	0.31	
Scopelosaurus meadi	0.72	12	0.28	
Bathyrcongus vicinus	0.66	12	0.26	
Glyphus marsupialis	0.60	30	0.24	
Aristeus varidens, female	0.36	18	0.14	
Aristeus varidens, male	0.30	48	0.12	
Ectreposeastes imus	0.30	6	0.12	
Bathypterois phenax	0.24	24	0.09	
MELANOSTOMIATIDAE	0.18	12	0.07	
Nephropsis atlantica	0.12	6	0.05	
Ebinania costaecanarie	0.12	6	0.05	
Gonostoma elongatum	0.12	6	0.05	
Lampadena sp.	0.12	12	0.05	
Peristedion cataphractum	0.06	12	0.02	
Total	253.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 99  
 DATE :20.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°35.82  
 start stop duration Lon E 12°51.58  
 TIME :22:07:41 22:32:48 25.1 (min) Purpose : 3  
 LOG : 3159.23 3160.43 1.2 Region : 4054  
 FDEPTH: 512 513 Gear cond.: 0  
 BDEPTH: 512 513 Validity : 0  
 Towing dir: 0° Wire out : 1070 m Speed : 2.9 kn  
 Sorted : 27 Total catch: 175.92 Catch/hour: 420.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	343.95	66043	81.86	
Hoplostethus cadenati	23.00	752	5.47	
Lamprogrammus exutus	15.05	511	3.58	
Aristeus varidens, female	8.41	435	2.00	
Aristeus varidens, male	4.94	647	1.18	
Stereomastis sp.	4.80	466	1.14	
Benthodesmus tenuis	3.89	134	0.93	
Stomias boa boa	3.44	74	0.82	
Triplophos hemingi	3.15	511	0.75	
MYCTOPHIDAE	2.84	1729	0.68	
Merluccius polli	1.53	2	0.36	
Yarella blackfordi	1.50	45	0.36	
Xenodermichthys copei	0.74	105	0.18	
Sergestes sp.	0.60	119	0.14	
Halosaurus ovenii	0.60	14	0.14	
Dibranchius atlanticus	0.60	29	0.14	
Melanocetus johnsoni	0.43	14	0.10	
Dicrolene intronigra	0.29	150	0.07	
Nezumia micronychodon	0.29	14	0.07	
Cataetx laticeps	0.14	29	0.03	
Total	420.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 100  
 DATE :21.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°36.37  
 start stop duration Lon E 12°53.97  
 TIME :00:53:34 01:24:14 30.7 (min) Purpose : 3  
 LOG : 3170.21 3171.71 1.5 Region : 4054  
 FDEPTH: 418 416 Gear cond.: 0  
 BDEPTH: 418 416 Validity : 0  
 Towing dir: 0° Wire out : 1020 m Speed : 2.9 kn  
 Sorted : 38 Total catch: 206.75 Catch/hour: 404.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	294.91	95096	72.91	
Chaunax pictus	27.58	284	6.82	
Merluccius polli	26.61	80	6.58	196
Laemonema laureysi	14.38	205	3.56	
Hymenocephalus italicus	10.47	1487	2.59	
Dibranchius atlanticus	5.18	362	1.28	
MYCTOPHIDAE	4.70	4861	1.16	
Neoharriotta pinnata	4.70	2	1.16	
Benthodesmus tenuis	4.40	166	1.09	
Parapenaeus longirostris, femal	3.62	411	0.89	
Aristeus varidens, female	1.08	117	0.27	
Gadella imberbis	1.08	39	0.27	
Malacocephalus occidentalis	0.98	20	0.24	
Etmopterus polli	0.88	39	0.22	
Aristeus varidens, male	0.78	108	0.19	
Bathynectes piperitus	0.68	10	0.17	
DERICHTHYDAE	0.59	10	0.15	
Halosaurus ovenii	0.49	49	0.12	
Stereomastis sp.	0.39	29	0.10	
Caelorinchus braueri	0.29	10	0.07	
Triplophos hemingi	0.29	49	0.07	
Parapenaeus longirostris, male	0.20	10	0.05	
Solenocera africana	0.10	10	0.02	
Peristedion cataphractum	0.10	10	0.02	
Total	404.47		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 101  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°34.61  
 start stop duration Lon E 13°0.82  
 TIME :05:13:26 05:43:39 30.2 (min) Purpose : 3  
 LOG : 3191.58 3193.09 1.5 Region : 4054  
 FDEPTH: 149 143 Gear cond.: 0  
 BDEPTH: 149 143 Validity : 0  
 Towing dir: 0° Wire out : 360 m Speed : 3.0 kn  
 Sorted : 81 Total catch: 255.94 Catch/hour: 508.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	196.69	14132	38.68	
Pterothrissus bellocci	71.03	523	13.97	
Dentex angolensis	57.32	278	11.27	197
Brotula barbata	41.42	42	8.15	
Trichiurus lepturus	40.47	89	7.96	
Grammolites gruweli	21.10	264	4.15	
Cynoponticus ferox	13.31	20	2.62	
Trigla lyra	9.24	75	1.82	
Parapenaeus longirostris, femal	8.54	2503	1.68	
Uranoscopus polli	6.20	95	1.22	
Citharus linguatula	5.36	89	1.05	
Zeus faber	4.61	30	0.91	
Brachydeuterus auritus	4.51	26	0.89	
Raja alba	4.29	2	0.84	
Torpedo torpedo	3.68	6	0.72	
Parapenaeus longirostris, male	3.38	1411	0.66	
G A S T R O P O D S	3.12	954	0.61	
Helicolenus dactylopterus	2.88	60	0.57	
Monolene microstoma	2.62	169	0.52	
Scylliorhinus cervigoni	1.99	2	0.39	
Lophiodes kempi	1.65	2	0.32	
Illex coindetii	1.43	46	0.28	
GOBIIDAE	0.99	433	0.20	
Pentheroscion mbizi	0.89	6	0.18	
Gadella imberbis	0.60	30	0.12	
Peristedion cataphractum	0.44	16	0.09	
Sepia orbignyana	0.40	6	0.08	
Squilla mantis	0.20	10	0.04	
Boops boops	0.14	6	0.03	
Total	508.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 102  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°36.22  
 start stop duration Lon E 13°3.81  
 TIME :06:40:16 07:10:17 30.0 (min) Purpose : 3  
 LOG : 3200.00 3201.49 1.5 Region : 4054  
 FDEPTH: 114 110 Gear cond.: 0  
 BDEPTH: 114 110 Validity : 0  
 Towing dir: 0° Wire out : 275 m Speed : 3.0 kn  
 Sorted : 181 Total catch: 332.59 Catch/hour: 664.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	385.84	2298	58.04	199
Dentex angolensis	110.45	500	16.62	198
Umbrina canariensis	26.98	162	4.06	200
Selene dorsalis	21.23	50	3.19	
Pterothrissus bellocci	20.69	216	3.11	
Trichiurus lepturus	18.53	126	2.79	
Brotula barbata	15.39	12	2.32	
Scorpaena stephanica	12.41	22	1.87	
Trigla lyra	7.73	50	1.16	
Spicara alta	7.51	64	1.13	
Boops boops	5.10	62	0.77	
Lagocephalus laevigatus	4.40	10	0.66	
Cynoponticus ferox	4.32	4	0.65	
Citharus linguatula	3.20	130	0.48	
Atractoscion aequidens	3.08	10	0.46	
Zeus faber	2.94	10	0.44	
Octopus vulgaris	2.62	4	0.39	
Miracorvina angolensis	2.52	10	0.38	
Chaetodon hoefleri	2.26	14	0.34	
Raja miraletus	2.02	4	0.30	
Torpedo torpedo	1.76	4	0.26	
Dentex congoensis	0.94	14	0.14	
Dentex barnardi	0.82	4	0.12	
Pontinus accraensis	0.58	4	0.09	
Alloteuthis africana	0.40	176	0.06	
Trachurus trecae	0.36	14	0.05	
Illex coindetii	0.32	8	0.05	
Saurida brasiliensis	0.26	62	0.04	
Arnoglossus imperialis	0.10	22	0.02	
Total	664.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 103  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°34.85  
 start stop duration Lon E 13°10.02  
 TIME :08:37:27 09:08:07 30.7 (min) Purpose : 3  
 LOG : 3209.20 3210.70 1.5 Region : 4054  
 FDEPTH: 79 75 Gear cond.: 0  
 BDEPTH: 79 75 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 2.9 kn  
 Sorted : 194 Total catch: 668.86 Catch/hour: 1308.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	749.15	9337	57.25	202
Trichiurus lepturus	198.96	873	15.20	
Stromateus fiatola	176.15	544	13.46	
Galeoides decadactylus	52.76	164	4.03	
Dentex angolensis	25.24	147	1.93	201
Trachurus trecae	17.24	657	1.32	203
Sepia orbignyana	13.26	45	1.01	
Dicologlossa cuneata	12.70	80	0.97	
Pomadourys incisus	11.68	63	0.89	
Zeus faber	10.04	39	0.77	
Brotula barbata	7.43	6	0.57	
Citharus linguatula	5.15	119	0.39	
Fistularia petimba	5.11	18	0.39	
Selene dorsalis	4.93	74	0.38	
Raja miraletus	4.42	6	0.34	
Torpedo torpedo	4.25	18	0.32	
Pagellus bellottii	3.50	23	0.27	
Chelidonichthys gabonensis	1.74	6	0.13	
Chlorophthalmus atlanticus	1.13	6	0.09	
Trigla lyra	0.96	6	0.07	
Saurida brasiliensis	0.84	245	0.06	
Octopus vulgaris	0.45	6	0.03	
Alloteuthis africana	0.39	90	0.03	
Uranoscopus polli	0.33	6	0.03	
Helicolenus dactylopterus	0.33	6	0.03	
GOBIIDAE	0.22	39	0.02	
Sardinella maderensis	0.16	6	0.01	
Total	1308.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 104  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°35.30  
 start stop duration Lon E 13°16.76  
 TIME :10:27:30 10:57:31 30.0 (min) Purpose : 3  
 LOG : 3219.14 3220.64 1.5 Region : 4054  
 FDEPTH: 42 42 Gear cond.: 0  
 BDEPTH: 42 42 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn  
 Sorted : 152 Total catch: 152.12 Catch/hour: 304.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	46.98	82	15.45	
Galeoides decadactylus	41.89	118	13.77	
Brachydeuterus auritus	34.29	3013	11.27	204
Chloroscombrus chrysurus	30.69	292	10.09	
Trichiurus lepturus	27.79	74	9.14	
Arius parkii	22.19	8	7.30	
Pomadasy jubelini	20.99	88	6.90	
Sepia officinalis hierredda	14.60	28	4.80	
Ephippion guttifer	10.50	4	3.45	
Grammolites gruvelli	6.36	116	2.09	
Zeus faber	5.78	14	1.90	
Caranx crysos	4.96	6	1.63	
Sepia orbignyana	4.58	42	1.51	
Pagellus bellottii	3.84	20	1.26	205
Dasyatis marmorata	3.70	2	1.22	
Alectis alexandrinus	3.62	6	1.19	
Citharus linguatula	3.40	106	1.12	
Sphyræna sphyraena	3.18	8	1.05	
Torpedo torpedo	2.08	8	0.68	
Pseudotolithus typus	1.96	4	0.64	
penaeus notialis,female	1.78	44	0.59	
Sardinella maderensis	1.52	24	0.50	
Alloteuthis africana	1.40	340	0.46	
Brotula barbata	1.02	10	0.34	
Rhinobatos albomaculatus	0.98	2	0.32	
Epinephelus aeneus	0.68	2	0.22	
Dentex barnardi	0.66	2	0.22	
Dicologlossa cuneata	0.60	8	0.20	
Stromateus fiatola	0.52	2	0.17	
Selene dorsalis	0.46	12	0.15	
penaeus notialis,male	0.46	24	0.15	
Euclinostomus melanopterus	0.36	4	0.12	
Pomadasy incisus	0.30	2	0.10	
GOBIIDAE	0.04	4	0.01	
Total	304.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 106  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°15.24  
 start stop duration Lon E 13°15.60  
 TIME :14:22:33 14:52:34 30.0 (min) Purpose : 3  
 LOG : 3244.84 3246.46 1.6 Region : 4054  
 FDEPTH: 28 29 Gear cond.: 0  
 BDEPTH: 28 29 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn  
 Sorted : 187 Total catch: 186.52 Catch/hour: 372.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Drepane africana	88.77	270	23.80	
Galeoides decadactylus	87.87	176	23.56	
Alectis alexandrinus	50.78	158	13.62	
Sphyræna guachancho	25.49	44	6.84	
Brachydeuterus auritus	19.19	588	5.15	208
Raja miraletus	18.19	26	4.88	
Dasyatis margarita	12.50	14	3.35	
Torpedo nobiliana	8.88	22	2.38	
Chloroscombrus chrysurus	8.74	54	2.34	
J E L L Y F I S H	8.14	118	2.18	
Gymnura micrura	7.62	26	2.04	
Trichiurus lepturus	6.64	14	1.78	
Pomadasy perotetti	5.50	6	1.47	
Cynoglossus canariensis	5.46	44	1.46	
Stromateus fiatola	5.38	22	1.44	
Sepia officinalis hierredda	2.68	4	0.72	
Lagocephalus laevigatus	1.66	4	0.44	
Arius heudelotii	1.30	2	0.35	
Sardinella maderensis	1.28	6	0.34	
Grammolites gruvelli	1.18	12	0.32	
Pseudotolithus senegalensis	1.10	2	0.29	
Torpedo marmorata	0.90	4	0.24	
Sardinops ocellatus	0.88	204	0.24	
Dicologlossa cuneata	0.88	16	0.24	
Euclinostomus melanopterus	0.56	4	0.15	
Sepia orbignyana	0.50	2	0.13	
Decapterus punctatus	0.42	6	0.11	
Selene dorsalis	0.32	2	0.09	
Penaeus notialis	0.06	4	0.02	
AMTENNARIIDAE	0.04	2	0.01	
Aluterus heudelotii	0.02	2	0.01	
Total	372.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 105  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°34.76  
 start stop duration Lon E 13°18.54  
 TIME :11:45:22 12:15:27 30.1 (min) Purpose : 3  
 LOG : 3225.25 3226.50 1.2 Region : 4054  
 FDEPTH: 30 30 Gear cond.: 0  
 BDEPTH: 30 30 Validity : 0  
 Towing dir: 0° Wire out : 90 m Speed : 2.5 kn  
 Sorted : 118 Total catch: 117.52 Catch/hour: 234.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dasyatis margarita	41.67	52	17.78	
Sepia officinalis hierredda	37.49	50	16.00	
Trichiurus lepturus	23.53	52	10.04	
Brachydeuterus auritus	20.34	3089	8.68	206
Ephippion guttifer	16.15	14	6.89	
Raja miraletus	15.65	24	6.68	
Sepia orbignyana	10.77	64	4.59	
Drepane africana	7.78	12	3.32	
Cynoglossus canariensis	6.76	78	2.88	
penaeus notialis,female	6.60	158	2.82	
Galeoides decadactylus	6.32	12	2.70	
Chloroscombrus chrysurus	6.12	44	2.61	
Citharus linguatula	5.86	92	2.50	
Grammolites gruvelli	5.40	108	2.31	
Sphyræna guachancho	4.39	12	1.87	
Alectis alexandrinus	3.45	26	1.47	
Dasyatis marmorata	3.35	2	1.43	
Euclinostomus melanopterus	2.53	34	1.08	
Dicologlossa cuneata	2.43	84	1.04	
Lagocephalus laevigatus	1.34	16	0.57	
penaeus notialis,male	1.14	68	0.49	
Selene dorsalis	0.82	18	0.35	
Dentex barnardi	0.72	12	0.31	207
Torpedo nobiliana	0.70	10	0.30	
Scyllarides herklotsii	0.62	2	0.26	
Pagellus bellottii	0.56	2	0.24	
Epinephelus aeneus	0.48	2	0.20	
Calappa rubroguttata	0.38	2	0.16	
Brotula barbata	0.32	6	0.14	
Pseudupeneus prayensis	0.32	4	0.14	
Zeus faber	0.24	2	0.10	
Sardinella maderensis	0.08	4	0.03	
Torpedo torpedo	0.04	4	0.02	
Total	234.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 107  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°15.25  
 start stop duration Lon E 13°12.20  
 TIME :15:35:41 16:05:43 30.0 (min) Purpose : 3  
 LOG : 3250.13 3251.81 1.7 Region : 4054  
 FDEPTH: 44 45 Gear cond.: 0  
 BDEPTH: 44 45 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.4 kn  
 Sorted : 235 Total catch: 412.33 Catch/hour: 824.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	228.23	458	27.69	
Stromateus fiatola	208.80	402	25.34	
Chloroscombrus chrysurus	143.16	1249	17.37	
Sphyræna guachancho	79.23	150	9.61	
Raja miraletus	45.99	94	5.58	
Alectis alexandrinus	39.69	60	4.82	
Pagellus bellottii	13.89	102	1.69	209
Pomadasy incisus	13.81	56	1.68	
Ephippion guttifer	11.29	4	1.37	
Sepia officinalis hierredda	9.93	8	1.21	
Sepia orbignyana	4.30	56	0.52	
Selene dorsalis	4.10	38	0.50	
Grammolites gruvelli	3.96	66	0.48	
Citharus linguatula	2.56	66	0.31	
Carcharhinus signatus	2.40	2	0.29	
Lagocephalus laevigatus	2.10	4	0.25	
Brachydeuterus auritus	2.02	312	0.24	
Rhinobatos albomaculatus	1.92	4	0.23	
Sea cucumbers	1.82	14	0.22	
Cynoglossus canariensis	1.22	10	0.15	
Epinephelus aeneus	0.90	4	0.11	
Pomadasy rogeri	0.80	4	0.10	
Torpedo torpedo	0.70	36	0.08	
Pseudupeneus prayensis	0.66	4	0.08	
Alloteuthis africana	0.60	178	0.07	
Decapterus rhonchus	0.04	8	0.00	
Total	824.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 108  
 DATE :21.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°18.17  
 start stop duration Lon E 13°9.32  
 TIME :16:53:37 17:23:26 29.8 (min) Purpose : 3  
 LOG : 3256.73 3258.22 1.5 Region : 4054  
 FDEPTH: 65 62 Gear cond.: 0  
 BDEPTH: 65 62 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.0 kn  
 Sorted : 124 Total catch: 911.56 Catch/hour: 1834.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1112.94	27527	60.68	212
Pseudolithus senegalensis	273.94	451	14.94	210
Pomadasys peroteti	166.00	390	9.05	211
Galeoides decadactylus	44.51	163	2.43	
Brotula barbata	35.47	50	1.93	
Trichiurus lepturus	25.15	89	1.37	
Trachurus trecae	24.41	213	1.33	213
Raja miraletus	20.74	26	1.13	
Dentex angolensis	18.99	101	1.04	
Pomadasys incisus	17.85	76	0.97	
Sepia orbigynana	15.59	101	0.85	
Chloroscombrus chrysurus	14.59	12	0.80	
Fagellus bellottii	12.70	113	0.69	
Torpedo torpedo	9.68	50	0.53	
Zeus faber	7.04	38	0.38	
Cynoponticus ferox	6.34	2	0.35	
Sardinella maderensis	5.92	163	0.32	
Citharus linguatula	5.65	189	0.31	
Argyrosomus hololepidotus	3.64	26	0.20	
ANTENNARIDAE	2.90	26	0.16	
Engraulis encrasicolus	2.39	441	0.13	
Grammolites gruvelli	2.39	38	0.13	
Saurida brasiliensis	1.89	328	0.10	
Pegusa lascaris	1.89	12	0.10	
Alloteuthis africana	1.01	227	0.05	
GOBIIDAE	0.50	113	0.03	
Total	1834.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 109  
 DATE :21.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°28.78  
 start stop duration Lon E 12°49.82  
 TIME :21:03:15 21:33:09 29.9 (min) Purpose : 3  
 LOG : 3287.05 3288.49 1.4 Region : 4054  
 FDEPTH: 449 452 Gear cond.: 0  
 BDEPTH: 449 452 Validity : 0  
 Towing dir: 0° Wire out : 1030 m Speed : 2.9 kn  
 Sorted : 46 Total catch: 214.55 Catch/hour: 430.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	228.46	56823	53.06	
Merluccius polli	125.22	301	29.08	
Laemonema laureysi	21.33	231	4.95	
Chaunax pictus	12.12	118	2.82	
Hymenocephalus italicus	8.01	1529	1.86	
Benthodesmus tenuis	6.68	279	1.55	
Gadella imberbis	5.50	219	1.28	
Dibranchius atlanticus	4.58	325	1.06	
Aristeus varidens, female	2.71	219	0.63	
Yarrella blackfordi	2.59	80	0.60	
Halosaurus ovenii	2.11	118	0.49	
Aristeus varidens, male	1.65	225	0.38	
Parapenaeus longirostris, femal	1.53	173	0.35	
Stereomastis sp.	1.26	167	0.29	
Stomias boa boa	1.12	26	0.26	
Malacocephalus laevis	1.06	14	0.25	
Trichiurus lepturus	1.02	2	0.24	
CONGRIDAE	0.92	6	0.21	
Triplphos hemingi	0.60	98	0.14	
Solenocera africana	0.60	66	0.14	
MYCTOPHIDAE	0.46	742	0.11	
Plesiopeanaeus edwardsianus	0.26	12	0.06	
Nezumia aequalis	0.26	26	0.06	
Hoplostethus cadenati	0.12	6	0.03	
S H R I M P S	0.12	20	0.03	
OMMASTREPHIDAE	0.12	6	0.03	
Etmopterus polli	0.12	6	0.03	
Total	430.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 110  
 DATE :21.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°28.43  
 start stop duration Lon E 12°48.52  
 TIME :22:50:54 23:21:08 30.2 (min) Purpose : 3  
 LOG : 3292.63 3294.11 1.5 Region : 4054  
 FDEPTH: 514 505 Gear cond.: 0  
 BDEPTH: 514 505 Validity : 0  
 Towing dir: 0° Wire out : 1140 m Speed : 2.9 kn  
 Sorted : 42 Total catch: 189.35 Catch/hour: 375.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	263.39	59990	70.11	
Lamprogrammus exutus	22.32	964	5.94	
Hoplostethus cadenati	16.79	454	4.47	
Stomias boa boa	14.82	286	3.95	
Yarrella blackfordi	14.46	411	3.85	
Aristeus varidens, female	8.93	429	2.38	
Benthodesmus tenuis	7.05	214	1.88	
Stereomastis sp.	6.96	607	1.85	
Aristeus varidens, male	3.66	419	0.97	
Chaunax pictus	2.95	18	0.78	
Dibranchius atlanticus	2.41	133	0.64	
S H R I M P S	2.05	294	0.55	
Triplphos hemingi	1.96	304	0.52	
Laemonema laureysi	1.88	89	0.50	
Xenodermichthys copei	1.79	161	0.48	
Merluccius polli	1.13	2	0.30	
Chlorophthalmus atlanticus	0.54	8	0.14	
Plesiopeanaeus edwardsianus	0.54	8	0.14	
Etmopterus pusillus	0.36	8	0.10	
Malacocephalus laevis	0.36	8	0.10	
Caelorinchus coelorhincus	0.36	26	0.10	
Halosaurus ovenii	0.36	8	0.10	
Gadella imberbis	0.18	8	0.05	
Bathyroconger vicinus	0.18	8	0.05	
Hymenocephalus italicus	0.09	18	0.02	
Parasudis fraser-bruenneri	0.09	8	0.02	
Solenocera africana	0.09	8	0.02	
Total	375.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 111  
 DATE :22.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°27.11  
 start stop duration Lon E 12°45.87  
 TIME :01:14:29 01:46:01 31.5 (min) Purpose : 3  
 LOG : 3305.13 3306.65 1.5 Region : 4054  
 FDEPTH: 723 732 Gear cond.: 0  
 BDEPTH: 723 732 Validity : 0  
 Towing dir: 0° Wire out : 1740 m Speed : 2.9 kn  
 Sorted : 42 Total catch: 136.15 Catch/hour: 259.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	118.71	34821	45.83	
Stereomastis sp.	34.62	2047	13.37	
OMMASTREPHIDAE	27.45	137	10.60	
Yarrella blackfordi	16.99	500	7.33	
Triplphos hemingi	14.04	2176	5.42	
Stomias boa boa	13.79	2844	5.33	
Lamprogrammus exutus	5.46	49	2.11	
Alepocephalus rostratus	5.14	74	1.98	
Nezumia aequalis	4.15	80	1.60	
Gadella sp.	4.09	137	1.58	
Hoplostethus cadenati	2.78	80	1.07	
Bathyroconger vicinus	2.72	44	1.05	
Aristeus varidens, female	1.67	74	0.65	
Todarodes sp.	1.43	6	0.55	
Cryptopsaras couesii	1.18	6	0.46	
Xenodermichthys copei	0.55	19	0.21	
Benthodesmus tenuis	0.38	13	0.15	
Bathypterois phenax	0.30	6	0.12	
Photichthys argenteus	0.30	13	0.12	
Aristeus varidens, male	0.25	19	0.10	
Glyphus marsupialis	0.25	13	0.10	
Dibranchius atlanticus	0.19	6	0.07	
Scopelosaurus meadi	0.19	6	0.07	
Plesiopeanaeus edwardsianus	0.13	6	0.05	
Ectreposebastes imus	0.13	6	0.05	
Bathylagus sp.	0.06	6	0.02	
Diaphus sp.	0.06	6	0.02	
Total	259.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 112  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°22.30  
 start stop duration Lon E 12°58.19  
 TIME :05:17:43 05:47:43 30.0 (min) Purpose : 3  
 LOG : 3326.74 3328.13 1.4 Region : 4054  
 FDEPTH: 121 123 Gear cond.: 0  
 BDEPTH: 121 123 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 2.8 kn  
 Sorted : 88 Total catch: 88.23 Catch/hour: 176.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	61.12	328	34.63	216
Umbrina canariensis	25.01	82	14.17	215
Zeus faber	11.90	38	6.74	
Brachydeuterus auritus	9.30	46	5.27	217
Spicara alta	8.30	74	4.70	
Dentex congoensis	7.94	106	4.50	
Pterothrissus bellucci	7.44	48	4.22	
Trachurus trecae	6.58	176	3.73	218
Trichiurus lepturus	6.06	12	3.43	
G A S T R O P O D S	6.00	770	3.40	
Brotula barbata	5.40	4	3.06	
Citharus linguatula	5.18	240	2.94	
Boops boops	2.46	50	1.39	
Attractoscion aequidens	2.44	2	1.38	
Octopus vulgaris	2.30	4	1.30	
Sea cucumbers	2.12	22	1.20	
Lagocephalus laevigatus	2.02	6	1.14	
Lophiodes kempi	1.14	2	0.65	
Uranoscopus cadenati	1.08	4	0.61	
Illex coindetii	1.04	66	0.59	
Trigla lyra	0.94	8	0.53	
Monolene microstoma	0.28	14	0.16	
Arnoglossus imperialis	0.16	20	0.09	
Sepia orbignyana	0.14	4	0.08	
Saurida brasiliensis	0.10	14	0.06	
GOBIIDAE	0.04	4	0.02	
Total	176.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 113  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°19.63  
 start stop duration Lon E 13°5.76  
 TIME :07:04:10 07:34:11 30.0 (min) Purpose : 3  
 LOG : 3337.34 3338.85 1.5 Region : 4054  
 FDEPTH: 87 82 Gear cond.: 0  
 BDEPTH: 87 82 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 3.0 kn  
 Sorted : 132 Total catch: 1256.47 Catch/hour: 2512.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1888.60	38988	75.15	220
Trachurus trecae	193.80	7164	7.71	219
Stromateus fiatola	117.42	152	4.67	
Selene dorsalis	55.30	380	2.20	
Zeus faber	36.86	114	1.47	
Dentex angolensis	28.12	172	1.12	
Torpedo torpedo	26.60	134	1.06	
Trichiurus lepturus	21.86	96	0.87	
Decapterus rhonchus	19.96	20	0.79	
Attractoscion aequidens	19.76	38	0.79	
Citharus linguatula	18.44	286	0.73	
Raja miraletus	14.44	20	0.57	
Sepia orbignyana	10.62	16	0.42	
Pterothrissus bellucci	10.26	228	0.41	
Engraulis encrasicolus	9.68	1710	0.39	
Brotula barbata	9.50	20	0.38	
Saurida brasiliensis	8.16	210	0.32	
Pegusa lascaris	7.60	38	0.30	
Sardinella maderensis	5.32	76	0.21	
Alloteuthis africana	5.32	2926	0.21	
Umbrina canariensis	4.56	20	0.18	
Arnoglossus imperialis	0.38	58	0.02	
GOBIIDAE	0.38	76	0.02	
Total	2512.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 114  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°7.72  
 start stop duration Lon E 12°59.67  
 TIME :09:41:42 10:12:26 30.7 (min) Purpose : 3  
 LOG : 3355.95 3357.36 1.4 Region : 4054  
 FDEPTH: 94 94 Gear cond.: 0  
 BDEPTH: 94 94 Validity : 0  
 Towing dir: 0° Wire out : 230 m Speed : 2.8 kn  
 Sorted : 48 Total catch: 48.38 Catch/hour: 94.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	44.52	275	47.13	221
Citharus linguatula	11.03	328	11.68	
Uranoscopus albesca	10.84	51	11.47	
Sepia orbignyana	3.59	117	3.80	
Alloteuthis africana	3.53	1488	3.74	
Chelidonichthys capensis	3.07	20	3.25	
Dentex barnardi	2.34	12	2.48	
Zeus faber	2.25	6	2.38	
Dicologlossa cuneata	2.01	10	2.13	
Trigla lyra	1.93	18	2.05	
Raja miraletus	1.52	6	1.61	
Brotula barbata	1.39	2	1.47	
Pagellus bellottii	1.27	25	1.34	222
Chaetodon hoefleri	0.98	6	1.03	
Fistularia petimba	0.94	4	0.99	
Torpedo marmorata	0.94	4	0.99	
Saurida brasiliensis	0.72	205	0.76	
Octopus vulgaris	0.66	4	0.70	
Scorpaena normani	0.47	4	0.50	
Sea cucumbers	0.45	14	0.48	
Arnoglossus imperialis	0.08	12	0.08	
Antennarius occidentalis	0.04	2	0.04	
Total	94.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 115  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°4.65  
 start stop duration Lon E 13°3.06  
 TIME :11:10:20 11:40:36 30.3 (min) Purpose : 3  
 LOG : 3362.88 3364.22 1.3 Region : 4054  
 FDEPTH: 71 70 Gear cond.: 0  
 BDEPTH: 71 70 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 2.6 kn  
 Sorted : 106 Total catch: 213.47 Catch/hour: 423.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	213.28	270	50.41	
Pomadasys peroteti	60.06	143	14.19	
Dentex angolensis	43.41	262	10.26	223
Trichiurus lepturus	18.63	48	4.40	
Brachydeuterus auritus	12.96	460	3.06	224
Citharus linguatula	12.88	321	3.04	
Grammolites gruvelli	8.56	127	2.02	
Torpedo torpedo	8.25	32	1.95	
Ephippion guttifer	7.93	4	1.87	
Octopus vulgaris	7.18	4	1.70	
Epinephelus aeneus	4.26	2	1.01	
Saurida brasiliensis	3.65	888	0.86	
B I V A L V E S	3.49	16	0.82	
Dicologlossa hexophthalma	3.21	20	0.76	
Raja miraletus	2.46	4	0.58	
Chaetodon hoefleri	2.30	16	0.54	
Alloteuthis africana	2.22	722	0.52	
Zeus faber	2.18	12	0.52	
Sepia orbignyana	1.63	16	0.38	
Chelidonichthys capensis	1.55	4	0.37	
Pagellus bellottii	0.87	36	0.21	225
Sardinella aurita	0.87	32	0.21	
Antennarius occidentalis	0.44	4	0.10	
Brotula barbata	0.36	4	0.08	
Dentex barnardi	0.24	8	0.06	
GOBIIDAE	0.08	16	0.02	
Decapterus punctatus	0.08	4	0.02	
Parapenaeus longirostris	0.08	12	0.02	
Sphoeroides sp.	0.04	4	0.01	
Total	423.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 116  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.66  
 start stop duration Lon E 13°3.89  
 TIME :12:18:58 12:49:00 30.1 (min) Purpose : 3  
 LOG : 3366.55 3368.06 1.5 Region : 4054  
 FDEPTH: 64 65 Gear cond.: 0  
 BDEPTH: 64 65 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.0 kn  
 Sorted : 38 Total catch: 38.25 Catch/hour: 76.37

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	17.17	80	22.48	226
Stromateus fiatola	16.97	18	22.22	
Raja miraletus	12.80	18	16.76	
Galeoides decadactylus	4.55	8	5.96	
Trichiurus lepturus	3.75	22	4.92	
Dentex barnardi	3.51	8	4.60	
Torpedo torpedo	2.90	22	3.79	
Octopus vulgaris	2.34	2	3.06	
Zeus faber	2.20	6	2.88	
Grammolites gruvelli	1.96	30	2.56	
Citharus linguatula	1.70	38	2.22	
Alloteuthis africana	1.62	415	2.12	
Sepia officinalis hierredda	1.52	2	1.99	
Brachydeuterus auritus	1.02	50	1.33	
Sepia orbignyana	0.72	6	0.94	227
Chaetodon hoefleri	0.56	2	0.73	
Saurida brasiliensis	0.44	54	0.58	
Sardinella aurita	0.32	4	0.42	
Brotula barbata	0.28	2	0.37	
Sphoeroides sp.	0.04	2	0.05	
Parapenaeus longirostris	0.02	6	0.03	
Total	76.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 117  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.96  
 start stop duration Lon E 13°7.68  
 TIME :13:47:03 14:17:04 30.0 (min) Purpose : 3  
 LOG : 3373.62 3375.14 1.5 Region : 4054  
 FDEPTH: 42 41 Gear cond.: 0  
 BDEPTH: 42 41 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn  
 Sorted : 452 Total catch: 451.50 Catch/hour: 902.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	271.51	846	30.08	
Pomadasyus jubelini	219.83	366	24.35	
Trichiurus lepturus	84.79	764	9.39	
Brachydeuterus auritus	76.97	5970	8.53	
Pseudotolithus senegalensis	58.48	84	6.48	229
Dasyatis marmorata	48.78	36	5.40	
Stromateus fiatola	46.48	84	5.15	
Pomadasyus peroteti	19.69	28	2.18	
Pseudotolithus typus	19.09	32	2.12	228
Raja miraletus	11.80	18	1.31	
Carcharhinus signatus	7.30	2	0.81	
Aleotix alexandrinus	7.14	20	0.79	
Arius parkii	6.96	6	0.77	
Dasyatis margarita	5.36	8	0.59	
Sphyrna guachancho	4.46	8	0.49	
Drepane africana	3.50	2	0.39	
Ephippion guttifer	2.44	2	0.27	
Selene dorsalis	1.98	16	0.22	
Citharus linguatula	1.80	58	0.20	
Torpedo torpedo	1.10	56	0.12	
Lagocephalus laevigatus	0.92	2	0.10	
Penaeus notialis	0.52	20	0.06	
Dicologlossa cuneata	0.32	8	0.04	
Pagellus bellottii	0.32	2	0.04	
Pisodonophis semicinctus	0.32	2	0.04	
Sepia orbignyana	0.24	4	0.03	
Grammolites gruvelli	0.22	4	0.02	
Cynoglossus canariensis	0.12	2	0.01	
Sardinella aurita	0.12	8	0.01	
Engraulis encrasicolus	0.10	38	0.01	
Decapterus rhonchus	0.04	2	0.00	
Total	902.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 118  
 DATE :22.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°2.11  
 start stop duration Lon E 13°9.55  
 TIME :15:03:35 15:26:20 22.8 (min) Purpose : 3  
 LOG : 3378.94 3380.15 1.2 Region : 4054  
 FDEPTH: 27 28 Gear cond.: 0  
 BDEPTH: 27 28 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.2 kn  
 Sorted : 193 Total catch: 697.84 Catch/hour: 1840.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	679.81	16787	36.94	
Galeoides decadactylus	300.50	1092	16.33	
Sphyrna guachancho	167.10	390	9.08	
Chloroscombrus chrysurus	159.03	1224	8.64	
Pseudotolithus senegalensis	114.41	322	6.22	230
Brachydeuterus auritus	111.56	2165	6.06	232
Drepane africana	75.48	76	4.10	
Pseudotolithus typus	58.87	95	3.20	231
Dasyatis marmorata	32.18	18	1.75	
Arius parkii	22.02	47	1.20	
Raja miraletus	21.36	29	1.16	
Trichiurus lepturus	18.99	105	1.03	
Selene dorsalis	17.17	179	0.93	
Panulirus regius	11.08	90	0.60	
Ephippion guttifer	10.05	11	0.55	
Torpedo nobiliana	7.96	37	0.43	
Sardinella maderensis	5.88	274	0.32	
Pomadasyus incisus	5.78	47	0.31	
Cynoglossus canariensis	4.17	37	0.23	
Gymnura micrura	3.51	29	0.19	
Umbriina canariensis	2.48	29	0.13	
Dicologlossa cuneata	1.98	29	0.11	
Pomadasyus rogeri	1.90	11	0.10	
Euclinostomus melanopterus	1.90	18	0.10	
Stromateus fiatola	1.71	11	0.09	
Miracorvina angolensis	1.61	11	0.09	
Sardinella aurita	1.13	47	0.06	
Parapenaeopsis atlantica	0.37	113	0.02	
ANTENNARIIDAE	0.29	11	0.02	
Penaeus notialis	0.18	18	0.01	
Total	1840.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 119  
 DATE :22.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°13.18  
 start stop duration Lon E 12°46.73  
 TIME :19:22:33 19:52:14 29.7 (min) Purpose : 3  
 LOG : 3410.45 3411.95 1.5 Region : 4054  
 FDEPTH: 303 306 Gear cond.: 0  
 BDEPTH: 303 306 Validity : 0  
 Towing dir: 0° Wire out : 720 m Speed : 3.0 kn  
 Sorted : 89 Total catch: 132.85 Catch/hour: 268.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	145.86	3051	54.31	
Gephyroberyx darwini	43.97	49	16.37	
Merluccius polli	36.83	139	13.71	233
Laemonema laureysi	8.31	194	3.09	
Pontinus accraensis	7.10	79	2.64	
Brotula barbata	6.11	4	2.27	
Trichiurus lepturus	4.37	28	1.63	
Malacocephalus occidentalis	3.34	24	1.24	
Parapenaeus longirostris, female	2.97	447	1.11	
Lophiodes kempii	2.32	6	0.87	
Parapenaeus longirostris, male	1.48	285	0.55	
Synagrops microlepis	1.46	89	0.54	
Grammolites gruvelli	1.23	24	0.46	
MYCTOPHIDAE	1.07	926	0.40	
Epigonus telescopus	0.61	34	0.23	
Gadella imberbis	0.57	22	0.21	
Caelorinchus caelorhincus	0.30	12	0.11	
Stereomastix sp.	0.24	18	0.09	
Peristedion cataphractum	0.18	22	0.07	
Shrimps, small, non comm.	0.14	77	0.05	
Solenocera africana	0.06	12	0.02	
Calappa pelii	0.06	4	0.02	
Total	268.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 120  
 DATE :22.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°14.84  
 start stop duration Lon E 12°43.88  
 TIME :21:10:56 21:36:36 25.7 (min) Purpose : 3  
 LOG : 3418.11 3419.41 1.3 Region : 4054  
 FDEPTH: 424 426 Gear cond.: 0  
 BDEPTH: 424 426 Validity : 0  
 Towing dir: 0° Wire out : 980 m Speed : 3.0 kn  
 Sorted : 48 Total catch: 188.21 Catch/hour: 439.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	253.14	76516	57.54	
Merluccius polli	92.44	397	21.01	
Laemonema laureysi	21.32	302	4.85	
Chaunax pictus	16.41	154	3.73	
Benthodesmus tenuis	12.76	442	2.90	
Hymenocephalus italicus	10.66	1045	2.42	
Centrophorus granulosus	7.95	2	1.81	
Malacocephalus occidentalis	4.42	56	1.00	
Bassanago albescens	4.00	21	0.91	
Raja alba	3.37	2	0.77	
Parapenaeus longirostris, female	2.66	27	0.61	
Chlorophthalmus atlanticus	2.38	56	0.54	
Dibranchius atlanticus	1.54	119	0.35	
MYCTOPHIDAE	1.47	1746	0.33	
Stomias boa boa	0.98	21	0.22	
Aristeus varidens, male	0.84	77	0.19	
Nezumia aequalis	0.63	35	0.14	
Triplophos hemingi	0.56	91	0.13	
Stereomastix sp.	0.56	77	0.13	
Aristeus varidens, female	0.49	35	0.11	
Solenocera africana	0.35	56	0.08	
Lophius vaillanti	0.28	7	0.06	
Gadella sp.	0.28	14	0.06	
Gadella imberbis	0.21	7	0.05	
Peristedion cataphractum	0.14	21	0.03	
Halosaurus ovenii	0.07	7	0.02	
Total	439.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 121  
 DATE :22.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°16.58  
 start stop duration Lon E 12°41.94  
 TIME :23:03:35 23:34:13 30.6 (min) Purpose : 3  
 LOG : 3425.28 3426.64 1.4 Region : 4054  
 FDEPTH: 615 602 Gear cond.: 0  
 BDEPTH: 615 602 Validity : 0  
 Towing dir: 0° Wire out : 1630 m Speed : 2.7 kn  
 Sorted : 52 Total catch: 364.10 Catch/hour: 712.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Triplophos hemingi	258.09	360	36.20	
Nematocarcinus africanus	227.35	60627	31.89	
Lamprogrammus exutus	103.53	987	14.52	
Hoplostethus cadonati	33.04	907	4.63	
Yarella blackfordi	31.55	916	4.42	
Stereomastix sp.	17.27	1788	2.42	
Stomias boa boa	14.80	307	2.08	
Aristeus varidens, female	6.17	282	0.87	
OMMASTREPHIDAE	3.52	18	0.49	
Xenodermichthys copei	2.82	237	0.40	
Aristeus varidens, male	2.72	335	0.38	
Trichiurus lepturus	2.19	78	0.31	
Gadella imberbis	2.11	166	0.30	
Dibranchius atlanticus	1.31	123	0.18	
S H R I M P S	1.06	237	0.15	
Nezumia micronychodon	0.88	18	0.12	
Bathyroconger vicinus	0.88	25	0.12	
Etmopterus polli	0.78	8	0.11	
Scopelosaurus meadi	0.78	8	0.11	
Alepocephalus rostratus	0.53	8	0.07	
Chlorophthalmus atlanticus	0.53	8	0.07	
Lampadena sp.	0.35	18	0.05	
Melanocetus johnsoni	0.35	43	0.05	
MYCTOPHIDAE	0.35	202	0.05	
Total	712.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 122  
 DATE :23.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°17.06 Lon E 12°41.22  
 start stop duration Purpose : 3  
 LOG : 3431.62 3433.17 1.6 Region : 4054  
 FDEPTH: 701 705 Gear cond.: 0  
 BDEPTH: 701 705 Validity : 0  
 Towing dir: 0° Wire out : 1680 m Speed : 2.9 kn  
 Sorted : 235 Total catch: 243.48 Catch/hour: 461.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	190.40	54745	41.28	
Stereorastis sp.	67.07	2251	14.54	
Lamprogrammus exutus	47.17	102	10.23	
Yarella blackfordi	45.70	1159	9.91	
Triplophos hemingi	37.28	5456	8.08	
THYSANOTEUTHIDAE	27.51	114	5.96	
Stomias boa boa	14.78	330	3.20	
Hopllostethus cadenati	6.59	205	1.43	
Nezumia cyrano	6.14	125	1.33	
Bathyrroconger vicinus	3.30	68	0.71	
Dicrolene intronigra	3.18	136	0.69	
Aristeus varidens, female	3.07	148	0.67	
Merluccius polli	1.36	2	0.30	
MYCTOPHIDAE	1.36	989	0.30	
Xenodermichthys copei	1.14	68	0.25	
Raja alba	0.91	11	0.20	
Cataetx laticeps	0.80	136	0.17	
Dibranchius atlanticus	0.80	34	0.17	
Benthodesmus tenuis	0.68	23	0.15	
Glyphus marsupialis	0.45	34	0.10	
Aristeus varidens, male	0.34	23	0.07	
Lampadena sp.	0.34	11	0.07	
Gadella imberbis	0.34	11	0.07	
Alepocephalus sp.	0.34	11	0.07	
Acanthephyra sp.	0.23	23	0.05	
Total	461.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 123  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°10.96 Lon E 12°55.08  
 start stop duration Purpose : 3  
 LOG : 3453.64 3455.10 1.5 Region : 4054  
 FDEPTH: 117 117 Gear cond.: 0  
 BDEPTH: 117 117 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 2.9 kn  
 Sorted : 129 Total catch: 296.82 Catch/hour: 594.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	138.23	379	23.25	
Dentex angolensis	122.56	553	20.61	234
Dentex congoensis	68.65	617	11.55	238
Trachurus trecae	56.67	2354	9.53	237
Trichiurus lepturus	49.54	92	8.33	
Brachydeuterus auritus	46.08	305	7.75	235
Umbria canariensis	37.32	142	6.28	236
Zeus faber	12.26	42	2.06	
Lagocephalus laevigatus	8.33	24	1.40	
Scorpaena stephanica	8.25	18	1.39	
Trigla lyra	8.25	70	1.39	
G A S T R O P O D S	7.83	1230	1.32	
Citharus linguatula	6.73	266	1.13	
Cynoponticus ferox	6.17	4	1.04	
Branchiostegus semifasciatus *	3.41	4	0.57	
Brotula barbata	3.33	4	0.56	
Raja miraletus	2.94	4	0.50	
Pagellus bellottii	2.44	42	0.41	
Uranoscopus polli	1.48	10	0.25	
Illex coindetii	1.16	102	0.20	
Chaetodon hoefleri	0.74	4	0.12	
Arnoglossus imperialis	0.56	170	0.09	
Sepia orbignyana	0.46	10	0.08	
Famulinus regius	0.42	4	0.07	
Saurida brasiliensis	0.36	170	0.06	
Spicara alta	0.24	4	0.04	
ANTENNARIDAE	0.14	4	0.02	
Anthias anthias	0.04	4	0.01	
Total	594.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 124  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°49.89 Lon E 13°3.28  
 start stop duration Purpose : 3  
 LOG : 3476.86 3478.59 1.7 Region : 4054  
 FDEPTH: 22 22 Gear cond.: 0  
 BDEPTH: 22 22 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.5 kn  
 Sorted : 182 Total catch: 182.10 Catch/hour: 363.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	118.74	294	32.65	
Chloroscombrus chrysurus	72.40	893	19.91	
Alectis alexandrinus	67.61	374	18.59	
Brachydeuterus auritus	21.47	599	5.90	239
Galeoides decadactylus	17.88	174	4.91	
Sardinella aurita	15.68	451	4.31	241
Sardinella maderensis	11.98	439	3.29	240
Pteromylaeus bovinus	6.49	2	1.78	
Pomadasys peroteti	5.43	4	1.49	
Ephippion guttifer	4.11	4	1.13	
Selene dorsalis	3.89	106	1.07	
Pagrus caeruleostictus	3.46	10	0.95	
Raja miraletus	2.94	4	0.81	
Rhinobatos albomaculatus	2.16	2	0.59	
Sphyræna guachancho	2.00	32	0.55	
Gymnura micrura	1.50	4	0.41	
Cynoglossus canariensis	1.48	4	0.41	
Caranx senegallus	1.02	10	0.28	
Pseudotolithus senegalensis	0.82	4	0.23	
Trachinotus ovatus	0.62	4	0.17	
Arius parkii	0.60	2	0.16	
Euclinostomus melanopterus	0.54	12	0.15	
Pseudupeneus prayensis	0.46	2	0.13	
G A S T R O P O D S	0.44	80	0.12	
Total	363.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 125  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°49.56 Lon E 13°0.69  
 start stop duration Purpose : 3  
 LOG : 3483.03 3484.62 1.6 Region : 4054  
 FDEPTH: 42 39 Gear cond.: 0  
 BDEPTH: 42 39 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.2 kn  
 Sorted : 163 Total catch: 802.36 Catch/hour: 1606.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	549.03	2785	34.18	
Brachydeuterus auritus	396.60	9916	24.69	244
Stromateus fiatola	115.74	206	7.20	
Chloroscombrus chrysurus	93.61	979	5.83	
Trichiurus lepturus	93.15	234	5.80	
Pseudotolithus senegalensis	68.87	122	4.29	243
Pomadasys jubelini	59.28	150	3.69	
Sphyræna guachancho	55.04	150	3.43	
Raja miraletus	30.67	46	1.91	
Selene dorsalis	27.29	509	1.70	
Rhinobatos albomaculatus	18.06	10	1.12	
Pomadasys incisus	17.88	56	1.11	
Dasyatis margarita	15.72	10	0.98	
Pagellus bellottii	12.87	56	0.80	242
Drepane africana	12.13	10	0.76	
Ephippion guttifer	10.35	10	0.64	
Cynoglossus canariensis	4.98	28	0.31	
Sepia orbignyana	4.98	10	0.31	
Dasyatis marmorata	4.40	10	0.27	
Citharus linguatula	2.82	66	0.18	
Grammolites gruvelli	2.82	38	0.18	
Sardinella aurita	2.72	66	0.17	
Zeus faber	2.52	10	0.16	
Torpedo torpedo	1.78	28	0.11	
Penaeus notialis	1.78	66	0.11	
Ilisha africana	0.84	18	0.05	
Decapterus rhonchus	0.38	18	0.02	
Total	1606.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 126  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°52.43 Lon E 12°58.98  
 start stop duration Purpose : 3  
 LOG : 3489.19 3490.60 1.4 Region : 4054  
 FDEPTH: 57 59 Gear cond.: 0  
 BDEPTH: 57 59 Validity : 0  
 Towing dir: 0° Wire out : 134 m Speed : 2.8 kn  
 Sorted : 346 Total catch: 345.83 Catch/hour: 688.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys incisus	355.76	1805	51.64	
Brachydeuterus auritus	113.76	972	16.51	245
Chloroscombrus chrysurus	56.77	410	8.24	
Pomadasys jubelini	35.36	78	5.13	
Selene dorsalis	20.42	179	2.96	
Raja miraletus	19.52	56	2.83	
Pagellus bellottii	18.73	114	2.72	246
Stromateus fiatola	11.75	12	1.71	
Rhinobatos albomaculatus	10.36	4	1.50	
Alectis alexandrinus	8.96	12	1.30	
Decapterus rhonchus	7.33	2	1.06	
Arius parkii	5.46	4	0.79	
Galeoides decadactylus	4.22	6	0.61	
Caranx crysos	4.02	4	0.58	
Trichiurus lepturus	3.25	8	0.47	
Zeus faber	2.09	6	0.30	
Pagrus caeruleostictus	1.93	4	0.28	
Grammolites gruvelli	1.85	42	0.27	
Fistularia petimba	1.47	4	0.21	
Sphyræna sphyraena	1.35	4	0.20	
Trachurus trecae	0.96	4	0.14	
Citharus linguatula	0.68	20	0.10	
Torpedo torpedo	0.62	2	0.09	
Cynoglossus canariensis	0.56	4	0.08	
Sepia orbignyana	0.48	6	0.07	
Sardinella aurita	0.40	10	0.06	
Alloteuthis africana	0.38	108	0.05	
Boops boops	0.34	2	0.05	
Ephippion guttifer	0.08	4	0.01	
Saurida brasiliensis	0.04	10	0.01	
Total	688.90		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 127  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°54.31  
 start stop duration Lon E 12°56.97  
 TIME :12:30:10 13:00:19 30.2 (min) Purpose : 3  
 LOG : 3494.21 3495.46 1.2 Region : 4054  
 FDEPTH: 71 70 Gear cond.: 0  
 BDEPTH: 71 70 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 2.5 kn  
 Sorted : 56 Total catch: 55.58 Catch/hour: 110.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	23.88	80	21.59	
Pagellus bellottii	13.33	203	12.05	247
Lepidotrigla cadmani	7.24	62	6.55	
Chloroscombrus chrysurus	6.19	44	5.60	
Trichiurus lepturus	5.85	8	5.29	
Rhinobatos albomaculatus	4.64	2	4.19	
Fistularia petimba	4.60	10	4.16	
Chelidonicichthys capensis	4.60	26	4.16	
Cynoglossus canariensis	4.28	18	3.87	
Octopus vulgaris	4.04	6	3.65	
Dasyatis marmorata	3.98	2	3.60	
Zeus faber	3.76	12	3.40	
Grammolites gruvelli	3.72	56	3.36	
Pseudupeneus prayensis	3.54	20	3.20	
Alloteuthis africana	2.75	1099	2.48	
Dentex barnardi	2.67	0	2.41	
Citharus linguatula	2.33	96	2.11	
Sepia orbignyana	1.61	16	1.46	
Dicologlossa cuneata	1.41	6	1.28	
Dentex canariensis	1.19	2	1.08	
Umbrina canariensis	1.09	2	0.99	
Pagrus caeruleostictus	0.98	2	0.88	
Sepia officinalis hierredda	0.52	2	0.47	
Chaetodon hoeferi	0.46	2	0.41	
Serranus accraensis	0.46	8	0.41	
Dentex angolensis	0.36	14	0.32	
Saurida brasiliensis	0.32	74	0.29	
Torpedo torpedo	0.26	2	0.23	
Dentex congoensis	0.24	4	0.22	
Arnoglossus imperialis	0.14	12	0.13	
Trachurus trecae	0.12	4	0.11	
Penaeus notialis	0.06	2	0.05	
Total	110.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 129  
 DATE :23.03.2010 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°56.22  
 start stop duration Lon E 12°50.74  
 TIME :16:30:26 17:00:07 29.7 (min) Purpose : 3  
 LOG : 3507.42 3508.91 1.5 Region : 4054  
 FDEPTH: 104 104 Gear cond.: 0  
 BDEPTH: 104 104 Validity : 0  
 Towing dir: 0° Wire out : 241 m Speed : 3.0 kn  
 Sorted : 135 Total catch: 134.97 Catch/hour: 272.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	193.06	542	70.76	
Brachydeuterus auritus	30.83	247	11.30	253
Fistularia petimba	14.86	36	5.45	
Dentex angolensis	8.69	105	3.19	254
Trachurus trecae	8.59	576	3.15	252
Pagellus bellottii	4.85	42	1.78	255
Trichiurus lepturus	4.27	8	1.56	
Decapterus rhonchus	2.45	2	0.90	
Stereomastis sp.	1.58	109	0.58	
Torpedo torpedo	1.11	2	0.41	
Zeus faber	0.89	2	0.33	
Saurida brasiliensis	0.42	81	0.16	
Pterothrissus belloci	0.40	6	0.15	
Trigla lyra	0.36	2	0.13	
Pontinus accraensis	0.22	2	0.08	
Dibranchius atlanticus	0.14	8	0.05	
Citharus linguatula	0.06	2	0.02	
Illex coindetii	0.06	6	0.02	
Total	272.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 130  
 DATE :24.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°3.10  
 start stop duration Lon E 12°36.98  
 TIME :01:26:41 01:56:50 30.2 (min) Purpose : 3  
 LOG : 3541.83 3543.43 1.6 Region : 4054  
 FDEPTH: 619 633 Gear cond.: 0  
 BDEPTH: 619 633 Validity : 0  
 Towing dir: 0° Wire out : 1490 m Speed : 3.2 kn  
 Sorted : 25 Total catch: 177.65 Catch/hour: 353.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	229.08	74698	64.82	
Yarella blackfordi	34.68	947	9.81	
Lamprogrammus exutus	21.45	70	6.07	
Stomias boa boa	12.12	237	3.43	
Hoplostethus cadenati	10.17	251	2.88	
Stereomastis sp.	5.85	501	1.65	
Xenodermichthys copei	5.15	306	1.46	
OMMASTREPHIDAE	5.01	28	1.42	
Chaunax pictus	3.76	28	1.06	
Aristeus varidens, female	3.48	153	0.99	
CRANCHIIDAE	2.92	14	0.83	
Merluccius polli	2.77	4	0.78	
UNIDENTIFIED FISH	2.37	14	0.67	
Triplophos hemingi	2.37	348	0.67	
Nezumia sp.	2.09	56	0.59	
Gonostoma sp.	1.67	56	0.47	
Alepocephalus sp.	1.67	56	0.47	
Acantheephyra sp.	1.25	167	0.35	
Laemonema laureysi	1.11	14	0.32	
Aristeus varidens, male	0.70	97	0.20	
MYCTOPHIDAE	0.56	125	0.16	
Benthodesmus tenuis	0.56	14	0.16	
DICERATIIDAE	0.56	14	0.16	
Bathyrcongiger vicinus	0.56	14	0.16	
CARISTIIDAE	0.56	14	0.16	
Dicrolene intronigra	0.56	28	0.16	
Raja sp.	0.42	14	0.12	
Total	353.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 131  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°0.21  
 start stop duration Lon E 12°43.26  
 TIME :05:19:25 05:49:15 29.8 (min) Purpose : 3  
 LOG : 3562.61 3564.12 1.5 Region : 4054  
 FDEPTH: 198 198 Gear cond.: 0  
 BDEPTH: 198 198 Validity : 0  
 Towing dir: 0° Wire out : 480 m Speed : 3.0 kn  
 Sorted : 89 Total catch: 318.59 Catch/hour: 641.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	410.76	29203	64.08	
Grammolites gruvelli	41.71	513	6.51	
Dentex angolensis	36.32	151	5.67	256
Brotula barbata	34.10	36	5.32	
Zeus faber	31.39	78	4.90	
Pterothrissus belloci	25.47	217	3.97	
Trichiurus lepturus	15.69	32	2.45	
Uranoscopus polli	11.89	72	1.86	
Pentheroscion mbizi	6.38	28	1.00	
Illex coindetii	5.92	115	0.92	
Miracorvina angolensis	5.81	8	0.91	
Monolene microstoma	4.65	416	0.73	
Euthynnus alletteratus	3.04	2	0.47	
Zenopsis conchifer	1.81	6	0.28	
Cynoponicus ferox	1.73	2	0.27	
Parapenaeus longirostris, femal	1.15	308	0.18	
Lophiodes kempii	1.09	2	0.17	
Umbrina canariensis	0.78	2	0.12	
G A S T R O P O D S	0.66	36	0.10	
Chlorophthalmus atlanticus	0.48	97	0.08	
Squilla mantis	0.06	6	0.01	
Helicolenus dactylopterus	0.06	6	0.01	
Parapenaeus longirostris, male	0.06	66	0.01	
Total	641.03		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 132  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°35.12  
 start stop duration Lon E 12°57.94  
 TIME :09:04:47 09:35:00 30.2 (min) Purpose : 3  
 LOG : 3595.27 3597.00 1.7 Region : 4054  
 FDEPTH: 22 22 Gear cond.: 0  
 BDEPTH: 22 22 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.4 kn  
 Sorted : 152 Total catch: 151.86 Catch/hour: 301.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	53.72	32701	17.81	
Gymnura micrura	39.72	20	13.17	
Ephippium guttifer	33.27	32	11.03	
Gymnura altavela	28.70	16	9.52	
Sphyræna guachancho	26.18	125	8.68	
Sardinella aurita	25.62	4256	8.49	
Galeoides decadactylus	18.87	163	6.26	
Pseudotolithus senegalensis	15.69	40	5.20	257
Pomadasyz rogeri	9.93	24	3.29	
Trachinotus sp.	5.54	4	1.84	
Rhinobatos cemiculus	5.36	2	1.78	
Euclinostomus melanopterus	4.65	97	1.54	
Rhinobatos albomaculatus	4.17	4	1.38	
Decapterus rhonchus	3.83	314	1.27	
Cynoglossus canariensis	3.73	22	1.24	
Selene dorsalis	3.22	147	1.07	
Alectis alexandrinus	2.70	2	0.90	
Sardinella maderensis	2.58	26	0.86	
Trichiurus lepturus	2.38	12	0.79	
Callinectes marginatus	1.91	8	0.63	
Ilisha africana	1.61	548	0.53	
Raja miraletus	1.51	4	0.50	
Arius parkii	1.47	4	0.49	
J E L Y F I S H	1.45	2	0.48	
Torpedo nobilliana	1.05	4	0.35	
Todaropsis eblanae	0.62	12	0.20	
Drepane africana	0.36	2	0.12	
Seriola carpenteri	0.26	4	0.09	
Dicologlossa cuneata	0.26	4	0.09	
Monolene microstoma	0.22	20	0.07	
Synagrops microlepis	0.20	16	0.07	
Chloroscombrus chrysurus	0.18	2	0.06	
Pterothrissus belloci	0.16	2	0.05	
Bembris heterurus	0.12	2	0.04	
penaeus notialis, male	0.12	12	0.04	
Bathyrcongiger vicinus	0.08	2	0.03	
penaeus notialis, female	0.08	6	0.03	
Epinephelus aeneus	0.06	2	0.02	
Pteroscion peli	0.04	2	0.01	
Total	301.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 133  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°36.00  
 start stop duration Lon E 12°56.48  
 TIME :10:40:53 11:00:28 19.6 (min) Purpose : 3  
 LOG : 3603.36 3604.49 1.1 Region : 4054  
 FDEPTH: 33 32 Gear cond.: 0  
 BDEPTH: 33 32 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.5 kn  
 Sorted : 28 Total catch: 28.24 Catch/hour: 86.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	17.15	37	19.83	
Rhinobatos albomaculatus	16.08	15	18.59	
Balistes caprisicus	16.08	18	18.59	
Pagellus bellottii	14.21	67	16.43	258
Pomadasyz jubelini	9.59	15	11.08	
Caranx crysos	6.83	12	7.90	
Pagrus caeruleostictus	2.17	6	2.51	
Pomadasyz rogeri	1.19	3	1.38	
Sardinella maderensis	1.19	6	1.38	
Dasyatis marmorata	0.83	6	0.96	
Citharus linguatula	0.46	3	0.53	
Alloteuthis africana	0.43	153	0.50	
Euclinostomus melanopterus	0.18	3	0.21	
Galeoides decadactylus	0.09	3	0.11	
Total	86.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 134  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°36.49  
 start stop duration Lon E 12°47.67  
 TIME :12:32:00 13:02:21 30.4 (min) Purpose : 3  
 LOG : 3616.24 3617.58 1.3 Region : 4054  
 FDEPTH: 72 72 Gear cond.: 0  
 BDEPTH: 72 72 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 2.6 kn  
 Sorted : 259 Total catch: 24.86 Catch/hour: 49.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Rhinobatos albomaculatus	8.20	4	16.69	
Raja miraletus	8.07	14	16.41	
Caranx crysos	6.82	8	13.88	
Zeus faber	5.65	24	11.50	
Pagellus bellottii	4.15	79	8.45	259
Alloteuthis africana	3.91	1742	7.96	
Sepia orbignyana	2.93	10	5.95	
Trichiurus lepturus	1.94	4	3.94	
Lagocephalus laevis	1.82	2	3.70	
Fistularia petimba	1.05	2	2.13	
Octopus vulgaris	0.83	4	1.69	
Grammolites gruvelli	0.73	20	1.49	
Dentex angolensis	0.63	67	1.29	260
Cynoglossus canariensis	0.55	2	1.13	
Chelidonichthys capensis	0.45	4	0.93	
Citharus linguatula	0.38	14	0.76	
Uranoscopus polli	0.34	2	0.68	
Lepidotrigla cadmani	0.30	2	0.60	
Saurida brasiliensis	0.26	51	0.52	
Arnoglossus imperialis	0.14	6	0.28	
Total	49.15		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 135  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°38.32  
 start stop duration Lon E 12°45.12  
 TIME :14:04:04 14:34:26 30.4 (min) Purpose : 3  
 LOG : 3623.49 3624.94 1.5 Region : 4054  
 FDEPTH: 88 87 Gear cond.: 0  
 BDEPTH: 88 87 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 2.9 kn  
 Sorted : 80 Total catch: 79.80 Catch/hour: 157.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lepidotrigla cadmani	51.66	383	32.77	
Dentex congoensis	28.84	375	18.30	
Dentex angolensis	18.47	152	11.72	
Raja miraletus	16.30	32	10.34	
Zeus faber	15.71	53	9.96	
Sepia orbignyana	6.14	28	3.90	
Citharus linguatula	4.66	156	2.96	
Pagellus bellottii	2.03	34	1.29	
Lagocephalus laevis	1.98	4	1.25	
Uranoscopus albesca	1.90	8	1.20	
Dentex barnardi	1.76	6	1.12	
Alloteuthis africana	1.62	624	1.03	
Chelidonichthys gabonensis	1.30	6	0.83	
Brachydeuterus auritus	1.15	8	0.73	
Chaetodon hoefleri	0.93	6	0.59	
Pagrus caeruleostictus	0.75	2	0.48	
Fistularia petimba	0.63	2	0.40	
Saurida brasiliensis	0.61	152	0.39	
Trachurus trecae	0.38	32	0.24	
Grammolites gruvelli	0.38	32	0.24	
Scorpaena normani	0.16	4	0.10	
Todaropsis eblanae	0.14	2	0.09	
Arnoglossus imperialis	0.12	12	0.08	
Octopus vulgaris	0.04	2	0.03	
Total	157.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 136  
 DATE :24.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°41.71  
 start stop duration Lon E 12°37.30  
 TIME :16:08:15 16:38:39 30.4 (min) Purpose : 3  
 LOG : 3637.47 3638.87 1.4 Region : 4054  
 FDEPTH: 117 117 Gear cond.: 0  
 BDEPTH: 117 117 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 2.8 kn  
 Sorted : 152 Total catch: 152.25 Catch/hour: 300.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	117.67	898	39.15	266
Trachurus trecae	69.99	3550	23.28	265
Trigla lyra	25.37	215	8.44	
Dentex congoensis	19.55	371	6.50	268
Lagocephalus laevis	13.43	20	4.47	
Brotula barbata	7.88	4	2.62	
Zeus faber	7.32	20	2.44	
Citharus linguatula	6.99	235	2.33	
Raja miraletus	5.03	10	1.67	
Squatina oculata	4.64	2	1.54	
Umbrina canariensis	3.77	14	1.25	
G A S T R O P O D S	2.69	227	0.89	
Pagellus bellottii	2.61	30	0.87	267
Illex coindetii	2.53	213	0.84	
Pterothrissus bellucci	2.33	2	0.78	
Lophiodes kempi	2.05	8	0.68	
Uranoscopus cadenati	1.78	6	0.59	
Ariomma bondi	1.05	20	0.35	
Torpedo torpedo	0.87	2	0.29	
Dentex barnardi	0.77	2	0.26	
Sepia orbignyana	0.75	10	0.25	
Spicara alta	0.59	32	0.20	
Arnoglossus imperialis	0.39	47	0.13	
Dicologlossa hexophthalma	0.34	10	0.11	
Helicolenus dactylopterus	0.16	2	0.05	
Chlorophthalmus atlanticus	0.06	20	0.02	
Total	300.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 137  
 DATE :24.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°43.33  
 start stop duration Lon E 12°33.18  
 TIME :17:47:29 18:17:16 29.8 (min) Purpose : 3  
 LOG : 3645.17 3646.62 1.5 Region : 4054  
 FDEPTH: 307 305 Gear cond.: 0  
 BDEPTH: 307 305 Validity : 0  
 Towing dir: 0° Wire out : 730 m Speed : 2.9 kn  
 Sorted : 91 Total catch: 182.60 Catch/hour: 367.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	202.89	4944	55.15	
Merluccius polli	83.41	1100	22.67	269
Laemonema laureysi	24.18	935	6.57	
Pterothrissus bellucci	13.90	85	3.78	
Malacocephalus occidentalis	9.43	101	2.56	
Gadella imberbis	8.42	254	2.29	
Parapanaeus longirostris, femal	3.63	500	0.99	
Synagrops microlepis	3.18	14	0.87	
MICTOPHIDAE	2.90	2784	0.79	
Trichiurus lepturus	2.54	20	0.69	
Zeus faber	2.14	40	0.58	
Hymenocephalus italicus	1.65	238	0.45	
Caelorinchus coelorhincus	1.17	16	0.32	
Todaropsis eblanae	0.97	4	0.26	
Aristeus varidens, male	0.93	64	0.25	
Aristeus varidens, female	0.89	28	0.24	
Parapanaeus longirostris, male	0.85	129	0.23	
Shrimps, small, non comm.	0.81	189	0.22	
Epigonus telescopus	0.81	8	0.22	
Bathyrhynchus vicinus	0.69	8	0.19	
Lophiodes kempi	0.64	8	0.18	
Stereomastis sp.	0.52	20	0.14	
Conger conger	0.48	4	0.13	
Peristedion cataphractum	0.40	32	0.11	
Pontinus accraensis	0.40	73	0.11	
Solenocera africana	0.08	16	0.02	
Total	367.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 138  
 DATE :24.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°42.97  
 start stop duration Lon E 12°32.18  
 TIME :19:17:14 19:47:06 29.9 (min) Purpose : 3  
 LOG : 3649.74 3651.25 1.5 Region : 4054  
 FDEPTH: 370 382 Gear cond.: 0  
 BDEPTH: 370 382 Validity : 0  
 Towing dir: 0° Wire out : 880 m Speed : 3.0 kn  
 Sorted : 76 Total catch: 234.23 Catch/hour: 470.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	307.33	61045	65.32	
Merluccius polli	53.93	247	11.46	270
Laemonema laureysi	30.43	422	6.47	
Centropristis squamosus	14.56	4	3.10	
Malacocephalus occidentalis	13.98	102	2.97	
Conger conger	8.32	96	1.77	
Trichiurus lepturus	7.65	18	1.63	
Chaunax pictus	7.47	24	1.59	
Scorpaena normani	4.52	6	0.96	
Hymenocephalus italicus	3.50	398	0.74	
Chlorophthalmus atlanticus	3.13	72	0.67	
Satyrium adeni	3.13	18	0.67	
Nezumia aequalis	3.07	54	0.65	
Lophiodes kempi	2.11	6	0.45	
Scorpaena stephanica	1.08	6	0.23	
Todaropsis eblanae	1.08	6	0.23	
Parapanaeus longirostris, femal	1.08	127	0.23	
Aristeus varidens, male	0.90	102	0.19	
Benthodesmus tenuis	0.60	18	0.13	
Dibranchius atlanticus	0.54	72	0.12	
Physiculus sp.	0.48	12	0.10	
Aristeus varidens, female	0.42	30	0.09	
Callinectes sp.	0.24	6	0.05	
Hoplostethus cadenati	0.24	6	0.05	
Peristedion cataphractum	0.24	54	0.05	
Stereomastis sp.	0.18	12	0.04	
Epigonus telescopus	0.18	6	0.04	
Parapanaeus longirostris, male	0.06	6	0.01	
Total	470.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 139  
 DATE :24.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°46.97  
 start stop duration Lon E 12°31.81  
 TIME :21:15:12 21:45:13 30.0 (min) Purpose : 3  
 LOG : 3656.45 3657.95 1.5 Region : 4054  
 FDEPTH: 633 634 Gear cond.: 0  
 BDEPTH: 633 634 Validity : 0  
 Towing dir: 0° Wire out : 1370 m Speed : 3.0 kn  
 Sorted : 55 Total catch: 165.83 Catch/hour: 331.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	163.09	36606	49.21	
Yarella blackfordi	43.17	1217	13.03	
Lamprogrammus exutus	31.06	270	9.37	
Stomias boa boa	26.68	510	8.05	
Hoplostethus cadenati	12.23	240	3.69	
Trichiurus lepturus	11.45	42	3.46	
OMMASTREPHIDAE	10.31	42	3.11	
Sterromastis sp.	9.17	648	2.77	
Lophius vaillanti	4.62	6	1.39	
Xenodermichthys copei	4.48	348	1.35	
Triplophos hemingi	2.82	378	0.85	
Aristeus varidens, female	2.82	144	0.85	
Scopelosaurus meadi	1.62	36	0.49	
ALEPOCEPHALIDAE	1.44	54	0.43	
Nezumia microrychodon	1.26	48	0.38	
Dicrolene intronigra	1.08	114	0.33	
MYCTOPHIDAE	0.66	564	0.20	
DICERATIIDAE	0.54	18	0.16	
Aristeus varidens, male	0.48	54	0.14	
Dibranchius atlanticus	0.42	54	0.13	
Laemonema laureysi	0.42	6	0.13	
Glyphus marsupialis	0.36	32	0.11	
Etmopterus polli	0.24	6	0.07	
GEMPYLIDAE	0.24	6	0.07	
Setarches guentheri	0.24	6	0.07	
MELANOSTOMIATIDAE	0.18	24	0.05	
Cataetx laticeps	0.12	12	0.04	
Acanthephyra sp.	0.12	12	0.04	
Synaphobranchus kaupii	0.12	6	0.04	
Total	331.44		100.0	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 140  
 DATE :24.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°46.86  
 start stop duration Lon E 12°30.59  
 TIME :22:57:55 23:28:02 30.1 (min) Purpose : 3  
 LOG : 3662.64 3663.98 1.3 Region : 4054  
 FDEPTH: 743 762 Gear cond.: 0  
 BDEPTH: 743 762 Validity : 0  
 Towing dir: 0° Wire out : 1570 m Speed : 2.7 kn  
 Sorted : 38 Total catch: 99.83 Catch/hour: 198.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	48.69	13305	24.48	
Sterromastis sp.	34.18	1574	17.19	
Sea cucumbers	25.42	36	12.78	
Yarella blackfordi	19.88	404	10.00	
Aristeus varidens, female	14.90	635	7.49	
Stomias boa boa	11.14	275	5.60	
Talismania longifiliis	8.23	58	4.14	
THYSANOTEUTHIDAE	7.25	32	3.65	
Nezumia microrychodon	5.18	98	2.60	
Hoplostethus cadenati	4.50	78	2.26	
CARISTIIDAE	4.18	20	2.10	
Triplophos hemingi	2.69	321	1.35	
OMMASTREPHIDAE	1.95	10	0.98	
Raja confundens	1.91	16	0.96	
Scopelosaurus meadi	1.14	20	0.57	
Aristeus varidens, male	1.08	104	0.54	
Lamprogrammus exutus	1.08	6	0.54	
Deania calcea	0.66	4	0.33	
Monomitopus metriostoma	0.66	10	0.33	
Bathypoconger vicinus	0.56	10	0.28	
Hirundichthys affinis	0.56	2	0.28	
DICERATIIDAE	0.56	6	0.28	
Benthodesmus tenuis	0.46	20	0.23	
Xenodermichthys copei	0.36	20	0.18	
Dicrolene intronigra	0.36	10	0.18	
MYCTOPHIDAE	0.26	58	0.13	
Photonectes braueri	0.20	32	0.10	
Bathypterois phenax	0.20	32	0.10	
Dibranchius atlanticus	0.20	10	0.10	
Cataetx laticeps	0.14	20	0.07	
Glyphus marsupialis	0.14	10	0.07	
STERNOPTYCHIDAE	0.10	10	0.05	
Gonostoma elongatum	0.04	10	0.02	
Nemichthys scolopaceus	0.04	10	0.02	
Total	198.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 141  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°14.77  
 start stop duration Lon E 12°45.72  
 TIME :05:14:55 05:38:17 23.4 (min) Purpose : 3  
 LOG : 3706.10 3707.30 1.2 Region : 4054  
 FDEPTH: 27 27 Gear cond.: 0  
 BDEPTH: 27 27 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn  
 Sorted : 152 Total catch: 151.93 Catch/hour: 390.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	240.00	1593	61.48	271
Epinephelus aeneus	24.93	3	6.38	
Rhinobatos albomaculatus	23.25	5	5.96	
Pseudupeneus prayensis	21.33	206	5.46	
Alectis alexandrinus	18.63	5	4.77	
RAJIDAE	12.85	23	3.29	
Pagrus auriga	7.35	15	1.88	
Balistes punctatus	6.50	13	1.67	
Scomberomorus tritor	5.52	3	1.42	
Aluterus heudelotii	5.50	13	1.41	
Sphyræna sphyraena	4.47	8	1.15	
Chelidonichthys lastoviza	3.13	3	0.80	
Dasyatis margarita	2.78	5	0.71	
Chloroscombrus chrysurus	2.44	15	0.63	
Chilomycterus spinosus mauret.	2.11	5	0.54	
Caranx crysos	1.95	3	0.50	
Xyrichtys novacula	1.44	10	0.37	
Fistularia tabacaria	1.23	5	0.32	
Trachinocephalus myops	1.21	8	0.31	
Rypticus saponaceus	0.93	10	0.24	
Sardinella maderensis	0.67	3	0.17	
G A S T R O P O D S	0.64	100	0.16	
Chaetodon hoefleri	0.59	13	0.15	
Dentex barnardi	0.46	10	0.12	
Sepia orbignyana	0.26	3	0.07	
Sardinella aurita	0.21	8	0.05	
Calappa sp.	0.03	3	0.01	
Total	390.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 142  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°16.15  
 start stop duration Lon E 12°41.10  
 TIME :06:29:25 07:00:15 30.8 (min) Purpose : 3  
 LOG : 3712.79 3714.27 1.5 Region : 4054  
 FDEPTH: 42 41 Gear cond.: 0  
 BDEPTH: 42 41 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 2.9 kn  
 Sorted : 96 Total catch: 95.73 Catch/hour: 186.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	67.53	183	36.25	273
Dentex barnardi	37.76	91	20.27	274
Rhinobatos albomaculatus	19.75	18	10.60	
Pagellus bellottii	17.90	82	9.61	272
Dasyatis margarita	15.18	16	8.15	
Aluterus heudelotii	6.21	8	3.33	
Chilomycterus spinosus mauret.	4.07	12	2.18	
Lagocephalus laevigatus	3.95	8	2.12	
Pseudupeneus prayensis	2.20	14	1.18	
Bodianus speciosus	1.99	2	1.07	
Chelidonichthys lastoviza	1.77	2	0.95	
Chaetodon hoefleri	1.19	10	0.64	
Trachinus armatus	1.13	8	0.61	
Trachinocephalus myops	0.86	6	0.46	
Xyrichtys novacula	0.86	6	0.46	
Epinephelus aeneus	0.80	2	0.43	
Syacium micrurum	0.72	4	0.39	
Uranoscopus polli	0.66	4	0.36	
Sepia orbignyana	0.66	4	0.36	
G A S T R O P O D S	0.37	43	0.20	
Rypticus saponaceus	0.35	4	0.19	
Scorpaena stephanica	0.33	2	0.18	
Coris sp.	0.08	2	0.04	
Total	186.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 143  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°21.17  
 start stop duration Lon E 12°39.38  
 TIME :08:06:11 08:26:13 20.0 (min) Purpose : 3  
 LOG : 3721.89 3722.94 1.1 Region : 4054  
 FDEPTH: 62 57 Gear cond.: 0  
 BDEPTH: 62 57 Validity : 0  
 Towing dir: 0° Wire out : 160 m Speed : 3.2 kn  
 Sorted : 28 Total catch: 27.75 Catch/hour: 83.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	30.40	48	36.58	
Pagellus bellottii	17.67	216	21.26	275
Rhinobatos albomaculatus	11.68	12	14.05	
Alloteuthis africana	6.05	3241	7.28	
Mustelus mustelus	4.55	6	5.48	
Chelidonichthys lastoviza	3.00	3	3.60	
Dentex barnardi	2.25	9	2.70	
Syacium micrurum	1.95	12	2.34	
Sepia orbignyana	1.65	12	1.98	
Lagocephalus laevigatus	1.53	3	1.84	
Fistularia petimba	1.02	3	1.23	
Decapterus rhonchus	0.33	6	0.40	
Bembrops greyi	0.33	24	0.40	
Citharus linguatula	0.27	36	0.32	
Arnoglossus imperialis	0.21	33	0.25	
Saurida brasiliensis	0.18	51	0.22	
PORTUNIDAE	0.06	9	0.07	
Total	83.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 144  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°23.21  
 start stop duration Lon E 12°33.85  
 TIME :09:34:50 10:04:58 30.1 (min) Purpose : 3  
 LOG : 3730.85 3732.39 1.5 Region : 4054  
 FDEPTH: 88 89 Gear cond.: 0  
 BDEPTH: 88 89 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 3.1 kn  
 Sorted : 66 Total catch: 66.38 Catch/hour: 132.23

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 146  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°27.73  
 start stop duration Lon E 12°18.30  
 TIME :13:42:37 14:12:30 29.9 (min) Purpose : 3  
 LOG : 3754.04 3755.46 1.4 Region : 4054  
 FDEPTH: 424 428 Gear cond.: 0  
 BDEPTH: 424 428 Validity : 0  
 Towing dir: 0° Wire out : 1020 m Speed : 2.9 kn  
 Sorted : 38 Total catch: 192.97 Catch/hour: 387.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	32.37	496	24.48	280
Dentex angolensis	15.14	183	11.45	276
Spondyllosoma cantharus	14.44	8	10.92	
Trigla lyra	11.16	82	8.44	
Dentex barnardi	7.87	42	5.95	279
Raja miraletus	7.83	14	5.92	
Zeus faber	6.18	18	4.67	
Rhinobatos albomaculatus	5.48	2	4.14	
Brotula barbata	5.18	4	3.92	
Sepia officinalis hierredda	4.20	2	3.18	
Pagrus caeruleostictus	2.97	6	2.24	
Pagellus bellottii	2.87	32	2.17	277
Trachurus trecae	2.81	155	2.12	278
Lagocephalus laevigatus	2.75	2	2.08	
Chaetodon hoefleri	2.43	14	1.84	
Citharus linguatula	2.03	72	1.54	
Uranoscopus polli	1.45	6	1.10	
Fistularia petimba	1.33	4	1.01	
Octopus vulgaris	1.10	4	0.83	
Chelidonichthys lastoviza	0.86	2	0.65	
Illex coindetii	0.72	44	0.54	
Saurida brasiliensis	0.42	127	0.32	
Arnoglossus imperialis	0.20	18	0.15	
Sepia orbignyana	0.18	14	0.14	
Grammolites gruvelli	0.12	2	0.09	
Sardinella aurita	0.10	2	0.08	
Alloteuthis africana	0.06	18	0.05	
Total	132.23		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	76.82	337	19.83	284
Trichiurus lepturus	66.14	201	17.08	
Nematocarcinus africanus	60.86	21406	15.71	
Triplophos hemingi	37.56	5223	9.70	
Laemonema laureysi	21.84	3021	5.64	
Lophius vaillanti	20.72	26	5.35	
Yarella blackfordi	17.79	821	4.59	
OMMASTREPHIDAE	11.48	60	2.96	
Dibranchus atlanticus	10.28	709	2.65	
Chaunax pictus	8.45	139	2.18	
Aristeus varidens, female	7.43	821	1.92	
THYSANOTEUTHIDAE	6.80	94	1.76	
Torpedo nobiliana	6.52	2	1.68	
Aristeus varidens, male	6.48	743	1.67	0
Pterothrissus belloci	3.19	18	0.82	
Chlorophthalmus atlanticus	3.19	44	0.82	
Stereomastis sp.	3.11	327	0.80	
Ariomma bondi	2.07	52	0.53	
Benthodesmus tenuis	2.07	86	0.53	
Glyphus marsupialis	1.99	1104	0.51	
Photonectes braueri	1.73	94	0.45	
Malacocephalus occidentalis	1.65	26	0.42	
Stomias boa boa	1.47	44	0.38	
Caelorinchus coelorhincus	1.20	34	0.31	
Halosaurus ovenii	0.86	52	0.22	
Bassanago albescens	0.86	18	0.22	
CARISTIIDAE	0.86	52	0.22	
Hymenocephalus italicus	0.86	60	0.22	
Zenopsis conchifer	0.72	2	0.19	
Nezumia sp.	0.60	44	0.16	
Solenocera africana	0.52	94	0.13	
MYCTOPHIDAE	0.44	112	0.11	
Bathynectes piperitus	0.26	26	0.07	
Gadella imberbis	0.26	18	0.07	
GEMPYLIDAE	0.18	2	0.05	
Nemichthys scolopaceus	0.08	26	0.02	
Total	387.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 145  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°24.65  
 start stop duration Lon E 12°27.05  
 TIME :11:13:25 11:43:30 30.1 (min) Purpose : 3  
 LOG : 3739.99 3741.31 1.3 Region : 4054  
 FDEPTH: 117 116 Gear cond.: 0  
 BDEPTH: 117 116 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 2.6 kn  
 Sorted : 131 Total catch: 131.49 Catch/hour: 262.19

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 147  
 DATE :25.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°29.67  
 start stop duration Lon E 12°14.32  
 TIME :15:56:35 16:26:40 30.1 (min) Purpose : 3  
 LOG : 3762.72 3764.26 1.5 Region : 4054  
 FDEPTH: 530 538 Gear cond.: 0  
 BDEPTH: 530 538 Validity : 0  
 Towing dir: 0° Wire out : 1200 m Speed : 3.1 kn  
 Sorted : 77 Total catch: 187.38 Catch/hour: 373.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	200.70	822	76.55	281
Lepidotrigla cadmani	11.63	92	4.43	
Raja miraletus	11.33	20	4.32	
Brotula barbata	9.07	8	3.46	
Dentex congoensis	8.33	90	3.18	283
Dentex barnardi	8.04	24	3.06	
Pagellus bellottii	4.21	20	1.60	282
Citharus linguatula	2.03	62	0.78	
Sphoeroides pachgaster	1.54	2	0.59	
Lophiodes kempii	1.50	2	0.57	
Zeus faber	1.08	4	0.41	
Ariomma bondi	0.90	16	0.34	
Uranoscopus cadenati	0.70	2	0.27	
Chaetodon hoefleri	0.56	4	0.21	
Arnoglossus imperialis	0.24	28	0.09	
Illex coindetii	0.18	4	0.07	
Sepia orbignyana	0.14	2	0.05	
Antennarius occidentalis	0.04	2	0.02	
Total	262.19		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	185.52	35378	49.65	
Hoplostethus cadenati	40.36	1224	10.80	
Lamprogrammus exutus	38.07	325	10.19	
Stomias boa boa	20.22	483	5.41	
Xenodermichthys copei	14.72	931	3.94	
Stereomastis sp.	14.26	3214	3.82	
Centrophorus granulosus	13.96	4	3.74	
Yarella blackfordi	11.70	371	3.13	
Gadella imberbis	5.92	223	1.59	
Trichiurus lepturus	4.91	32	1.31	
Merluccius polli	4.89	8	1.31	
Triplophos hemingi	4.45	554	1.19	
Aristeus varidens, male	3.91	166	1.05	
OMMASTREPHIDAE	2.07	28	0.56	
Coloconger sp.	1.42	10	0.38	
Malacocephalus occidentalis	1.42	18	0.38	
Photonectes braueri	1.38	60	0.37	
Ectreposebastes imus	0.70	10	0.19	
Laemonema laureysi	0.56	4	0.15	
Ariomma bondi	0.46	4	0.12	
UNIDENTIFIED FISH	0.42	32	0.11	
Halosaurus ovenii	0.42	14	0.11	
Nemichthys scolopaceus	0.36	18	0.10	
Aristeus varidens, female	0.32	56	0.09	
Benthodesmus tenuis	0.28	10	0.07	
Shrimps, small, non comm.	0.28	92	0.07	
Bathyrhoconger vicinus	0.18	10	0.05	
Promethichthys prometheus	0.14	4	0.04	
Etmopterus polli	0.14	2	0.04	
Dibranchus atlanticus	0.10	4	0.03	
DICERATIIDAE	0.10	4	0.03	
Lampadena sp.	0.04	4	0.01	
Total	373.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 148  
 DATE :25.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°32.83 Lon E 12°14.79  
 start stop duration Purpose : 3  
 LOG : 3771.47 3772.79 1.3 Region : 4054  
 FDEPTH: 712 694 Gear cond.: 0  
 BDEPTH: 712 694 Validity : 0  
 Towing dir: 0° Wire out : 1430 m Speed : 2.7 kn  
 Sorted : 51 Total catch: 116.44 Catch/hour: 234.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exutus	43.57	143	18.57	
Nezumia aequalis	43.57	1088	18.57	
Yarella blackfordi	40.79	792	17.38	
Stereomastis sculpta	28.74	2507	12.25	
Shrimps, small, non comm.	14.59	4107	6.22	
Gadella sp.	12.70	849	5.41	
Aristeus varidens, female	8.57	375	3.65	
Bathyroconger vicinus	6.39	83	2.72	
Stomias boa boa	5.89	129	2.51	
Hoplostethus cadenati	5.84	64	2.49	
J E L Y F I S H	3.99	50	1.70	
Raja alba	3.53	14	1.50	
Talismania longifiliis	2.54	83	1.08	
Triplophos hemingi	2.54	339	1.08	
Halosaurus ovenii	2.36	28	1.00	
Caristius sp	1.49	89	0.64	
Chaceon maritae	1.25	4	0.53	
DICERATIIDAE	1.11	10	0.47	
Unidentified fish	1.03	121	0.44	
Plesiopeneaeus edwardsianus	0.83	46	0.35	
Aristeus varidens, male	0.79	107	0.33	
Xenodermichthys copei	0.79	46	0.33	
Trichiurus lepturus	0.60	4	0.26	
MYCTOPHIDAE	0.36	175	0.15	
Ebinania costaecanariae	0.32	4	0.14	
Dibranchius atlanticus	0.28	22	0.12	
Bathypterois phenax	0.22	46	0.09	
Total	234.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 149  
 DATE :25.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°21.27 Lon E 12°1.41  
 start stop duration Purpose : 3  
 LOG : 3792.93 3794.35 1.4 Region : 4054  
 FDEPTH: 529 533 Gear cond.: 0  
 BDEPTH: 529 533 Validity : 0  
 Towing dir: 0° Wire out : 1160 m Speed : 2.9 kn  
 Sorted : 33 Total catch: 152.16 Catch/hour: 305.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	136.40	34264	44.66	
Yarella blackfordi	45.79	1409	14.99	
Lamprogrammus exutus	19.77	534	6.47	
Triplophos hemingi	16.90	2449	5.53	
Merluccius polli	14.27	28	4.67	
Stereomastis sp.	13.47	1076	4.41	
Chaceon maritae	13.29	18	4.35	
Stomias boa boa	12.10	253	3.96	
Chaunax pictus	7.31	54	2.39	
Centrophorus granulosus	4.62	2	1.51	
Aristeus varidens, female	4.07	173	1.33	
Benthodesmus tenuis	3.43	82	1.12	
Plesiopeneaeus edwardsianus	2.35	46	0.77	
Laemonema laureysi	2.09	18	0.68	
OMMASTREPHIDAE	1.99	10	0.65	
Malacocephalus occidentalis	1.89	18	0.62	
Hoplostethus cadenati	1.45	36	0.47	
Gadella imberbis	1.16	100	0.38	
Caelorinchus sp.	0.80	10	0.26	
Aristeus varidens, male	0.72	72	0.24	
Nezumia micronychodon	0.62	18	0.20	
CONGRIDAE	0.18	18	0.06	
DICERATIIDAE	0.18	28	0.06	
Raja sp.	0.18	10	0.06	
Synaphobranchus kaupii	0.10	10	0.03	
MYCTOPHIDAE	0.10	36	0.03	
Cataetx laticeps	0.10	10	0.03	
Xenodermichthys copei	0.10	10	0.03	
Total	305.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 150  
 DATE :25.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°20.21 Lon E 12°4.04  
 start stop duration Purpose : 3  
 LOG : 3800.01 3801.46 1.4 Region : 4054  
 FDEPTH: 418 407 Gear cond.: 0  
 BDEPTH: 418 407 Validity : 0  
 Towing dir: 0° Wire out : 1000 m Speed : 2.9 kn  
 Sorted : 39 Total catch: 106.03 Catch/hour: 211.57

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Benthodesmus sp.	63.09	2003	29.82	
Merluccius polli	54.31	235	25.67	285
Nematocarcinus africanus	20.13	5707	9.52	
Hymenocephalus italicus	19.53	1564	9.23	
Gadella sp.	19.10	339	9.03	
Stereomastis sp.	8.34	746	3.94	
Parapeneaeus longirostris, femal	7.58	850	3.58	
Malacocephalus laevis	4.99	32	2.36	
Trichiurus lepturus	3.01	6	1.42	
Aristeus varidens, male	2.35	257	1.11	
Chaunax pictus	1.60	44	0.75	
Stomias boa boa	1.42	44	0.67	
Laemonema laureysi	1.26	94	0.59	
Aristeus varidens, female	0.98	54	0.46	
Lophiodes kempii	0.76	6	0.36	
Bathyroconger vicinus	0.72	16	0.34	
Halosaurus ovenii	0.48	22	0.23	
Epigonus telescopus	0.44	10	0.21	
Gadella imberbis	0.44	10	0.21	
Synagrops microlepis	0.38	10	0.18	
Dibranchius atlanticus	0.28	28	0.13	
Chlorophthalmus atlanticus	0.16	6	0.08	
MYCTOPHIDAE	0.10	22	0.05	
Synaphobranchus kaupii	0.06	6	0.03	
Raja alba	0.06	6	0.03	
Total	211.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 151  
 DATE :26.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°5.18 Lon E 12°36.15  
 start stop duration Purpose : 3  
 LOG : 3841.35 3842.86 1.5 Region : 4054  
 FDEPTH: 37 36 Gear cond.: 0  
 BDEPTH: 37 36 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn  
 Sorted : 0 Total catch: 18.36 Catch/hour: 37.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	14.13	75	38.13	286
Trachinus arenatus	5.85	18	15.80	
Sepia officinalis hierredda	3.78	4	10.19	
Rhinobatos albomaculatus	2.81	2	7.57	
Xyrichtys novacula	2.38	18	6.43	
Lagocephalus laevigatus	1.90	6	5.12	
Citharichthys stamplii	0.99	12	2.67	
Pegusa lascaris	0.89	4	2.40	
Citharus linguatula	0.83	18	2.23	
Fistularia petimba	0.63	2	1.69	
Chilomycterus spinosus mauret.	0.57	2	1.53	
Pseudupeneus prayensis	0.52	2	1.42	
Sepia orbignyana	0.50	2	1.36	
Aluterus heudelotii	0.44	2	1.20	
Sardinella aurita	0.30	4	0.82	
Rypticus saponaceus	0.28	4	0.76	
Trachinus armatus	0.26	2	0.71	
Total	37.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 152  
 DATE :26.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°7.99 Lon E 12°31.77  
 start stop duration Purpose : 3  
 LOG : 3849.27 3850.77 1.5 Region : 4054  
 FDEPTH: 49 49 Gear cond.: 0  
 BDEPTH: 49 49 Validity : 0  
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn  
 Sorted : 78 Total catch: 77.99 Catch/hour: 155.77

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	89.88	228	57.70	287
Dentex barnardi	15.98	38	10.26	288
Citharus linguatula	5.41	36	3.47	
Octopus vulgaris	5.19	4	3.33	
Chilomycterus spinosus mauret.	4.93	18	3.17	
Aluterus heudelotii	4.55	6	2.92	
Pagrus africanus	4.39	6	2.82	
Raja miraletus	2.96	4	1.90	
Chilomycterus reticulatus	2.88	2	1.85	
Pagellus bellottii	2.48	12	1.59	
Chelidonichthys gabonensis	2.36	12	1.51	
Rypticus saponaceus	2.32	20	1.49	
Chelidonichthys lastoviza	2.26	4	1.45	
Mustelus mustelus	2.20	2	1.41	
Cephalopholis taeniops	1.52	4	0.97	
Sea urchins (strong spines)	1.30	78	0.83	
Scorpaena stephanica	1.26	10	0.81	
Rhinobatos albomaculatus	1.14	2	0.73	
Chaetodon hoeferli	0.82	4	0.53	
Fistularia petimba	0.54	2	0.35	
Pseudupeneus prayensis	0.48	4	0.31	
Sepia officinalis hierredda	0.38	2	0.24	
Sepia orbignyana	0.28	4	0.18	
Trachinus arenatus	0.14	2	0.09	
Trachinus arenatus	0.14	2	0.09	
Total	155.77		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 153  
 DATE :26.03.2010 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°13.73  
 start stop duration Lon E 12°20.34  
 TIME :08:50:07 09:20:07 30.0 (min) Purpose : 3  
 LOG : 3864.97 3866.46 1.5 Region : 4054  
 FDEPTH: 118 117 Gear cond.: 8  
 BDEPTH: 118 117 Validity : 4  
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn  
 Sorted : 59 Total catch: 58.70 Catch/hour: 117.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	55.60	384	47.36	289
Trigla lyra	29.60	212	25.21	
Sea urchins (strong spines)	10.90	818	9.28	
Trichiurus lepturus	4.72	8	4.02	
Raja miraletus	4.14	6	3.53	
Dentex congoensis	4.06	46	3.46	290
Dentex barnardi	1.80	6	1.53	
Scorpaena stephanica	1.62	4	1.38	
Citharus linguatula	1.02	28	0.87	
Uranoscopus polli	0.98	4	0.83	
Brotula barbata	0.86	2	0.73	
Zeus faber	0.76	2	0.65	
Anthias anthias	0.44	2	0.37	
Pagellus bellottii	0.42	4	0.36	
Sea cucumbers	0.26	2	0.22	
Sepia orbignyana	0.10	4	0.09	
Arnoglossus imperialis	0.06	8	0.05	
Spicara alta	0.02	2	0.02	
Saurida brasiliensis	0.02	4	0.02	
Illex coindetii	0.02	2	0.02	
Total	117.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 156  
 DATE :26.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°56.74  
 start stop duration Lon E 12°10.99  
 TIME :16:12:55 16:43:03 30.1 (min) Purpose : 3  
 LOG : 3910.24 3911.69 1.5 Region : 4054  
 FDEPTH: 86 87 Gear cond.: 0  
 BDEPTH: 86 87 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 2.9 kn  
 Sorted : 68 Total catch: 68.19 Catch/hour: 135.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	91.17	999	67.17	300
Dentex angolensis	18.31	141	13.49	297
Decapterus rhonchus	5.55	6	4.09	
Lagocephalus laevigatus	3.74	2	2.76	
Pagellus bellottii	3.24	20	2.39	298
Trachurus trecae	2.91	159	2.14	299
Fistularia petimba	2.73	8	2.01	
Squatina oculata	2.39	2	1.76	
Dentex barnardi	2.25	6	1.66	
Pagrus caeruleostictus	1.71	4	1.26	
Zeus faber	0.76	4	0.56	
Chaetodon hoefleri	0.44	2	0.32	
Trigla lyra	0.40	2	0.29	
Alloteuthis africana	0.14	38	0.10	
Total	135.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 154  
 DATE :26.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°15.45  
 start stop duration Lon E 12°9.03  
 TIME :11:25:40 11:55:44 30.1 (min) Purpose : 3  
 LOG : 3880.54 3881.92 1.4 Region : 4054  
 FDEPTH: 237 230 Gear cond.: 0  
 BDEPTH: 237 230 Validity : 0  
 Towing dir: 0° Wire out : 560 m Speed : 2.8 kn  
 Sorted : 90 Total catch: 460.37 Catch/hour: 918.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	622.36	29341	67.73	
Dentex angolensis	162.77	433	17.71	291
Zenopsis conchifer	51.10	248	5.56	
Trichiurus lepturus	24.51	80	2.67	
Brotula barbata	20.56	20	2.24	
Hepttranchias perlo	15.67	6	1.71	
Pterothrissus belloci	5.75	48	0.63	
Zeus faber	4.47	16	0.49	
Raja clavata	3.27	8	0.36	
Illex coindetii	1.84	32	0.20	
Umbrina canariensis	1.50	2	0.16	
Todaropsis eblanae	1.44	8	0.16	
Bembrops heterurus	1.44	24	0.16	
Lepidotrigla cadmani	1.28	8	0.14	
Monolene microstoma	0.40	24	0.04	
Chlorophthalmus atlanticus	0.32	16	0.03	
Calappa-like with spines	0.24	8	0.03	
Total	918.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 157  
 DATE :26.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°11.54  
 start stop duration Lon E 12°52.46  
 TIME :20:16:16 20:45:42 29.4 (min) Purpose : 3  
 LOG : 3938.23 3939.69 1.5 Region : 4054  
 FDEPTH: 629 630 Gear cond.: 0  
 BDEPTH: 629 630 Validity : 0  
 Towing dir: 0° Wire out : 1350 m Speed : 3.0 kn  
 Sorted : 75 Total catch: 74.91 Catch/hour: 152.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarellia blackfordi	38.23	71	25.03	
Centroscymnus crepidater	19.98	2	13.08	
Stereomastix sp.	17.84	1160	11.68	
Lamprogrammus exutus	14.88	43	9.75	
Nematocarcinus africanus	11.82	3213	7.74	
Stomias boa boa	11.42	29	7.48	
Caelorinchus coelorhincus	8.66	206	5.67	
Dicrolene intronigra	4.26	326	2.79	
CHLAMYDOSELACHIDAE	3.06	2	2.00	
Merluccius polli	2.53	4	1.66	
OMASTREPHIDAE	2.18	12	1.43	
Aristeus varidens, female	2.16	96	1.42	
Triplophos hemingi	2.12	314	1.39	
Etmopterus polli	2.04	6	1.33	
Trichiurus lepturus	1.61	6	1.05	
Hoplostethus cadenati	1.37	37	0.89	
Bathyroconger vicinus	1.35	12	0.88	
Coloconger sp.	1.12	4	0.73	
Xenodermichthys copei	0.94	53	0.61	
Halosaurus ovenii	0.84	12	0.55	
Talismaania longifilis	0.59	16	0.39	
Chaunax pictus	0.49	6	0.32	
Plesiopenaeus edwardsianus	0.49	27	0.32	
Synaphobranchus kaupii	0.47	8	0.31	
Gadella imberbis	0.43	29	0.28	
Photeneutes braueri	0.35	37	0.23	
MYCTOPHIDAE	0.24	133	0.16	
Unidentified fish	0.22	2	0.15	
Todarodes sagittatus	0.16	2	0.11	
Aristeus varidens, male	0.14	18	0.09	
Scopelosaurus meadi	0.14	4	0.09	
UNIDENTIFIED FISH	0.12	12	0.08	
Nemichthys scolopaceus	0.12	2	0.08	
EVERMANNELLIDAE	0.10	2	0.07	
Etmopterus pusillus	0.08	2	0.05	
Ectreposeastes sp.	0.08	6	0.05	
NETTASTOMATIDAE	0.04	4	0.03	
Benthodesmus tenuis	0.04	2	0.03	
Total	152.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 155  
 DATE :26.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°56.26  
 start stop duration Lon E 12°13.52  
 TIME :14:38:23 15:08:31 30.1 (min) Purpose : 3  
 LOG : 3902.67 3904.00 1.3 Region : 4054  
 FDEPTH: 82 82 Gear cond.: 0  
 BDEPTH: 82 82 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 2.6 kn  
 Sorted : 387 Total catch: 386.60 Catch/hour: 769.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	411.28	898	53.44	295
Decapterus rhonchus	149.70	133	19.45	
Dentex angolensis	64.30	293	8.35	294
Dentex barnardi	38.72	167	5.03	296
Pagellus bellottii	22.79	121	2.96	293
Trichiurus lepturus	19.51	4	2.53	
Epinephelus aeneus	19.41	4	2.52	
Dentex congoensis	18.91	129	2.46	292
Chaetodon hoefleri	5.02	24	0.65	
Fistularia petimba	4.70	14	0.61	
Mustelus mustelus	4.58	2	0.59	
Lagocephalus laevigatus	3.22	2	0.42	
Pagrus caeruleostictus	3.07	6	0.40	
Raja miraletus	1.77	2	0.23	
Chelidonicichthys capensis	1.31	2	0.17	
Cynoglossus canariensis	1.31	2	0.17	
Total	769.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 158  
 DATE :26.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°11.49 Lon E 11°48.99  
 start stop duration Purpose : 3  
 LOG : 3952.95 3954.34 1.4 Region : 4054  
 FDEPTH: 774 781 Gear cond.: 0  
 BDEPTH: 774 781 Validity : 0  
 Towing dir: 0° Wire out : 1550 m Speed : 2.7 kn  
 Sorted : 39 Total catch: 103.08 Catch/hour: 202.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia micronychodon	59.67	1300	29.51	
E C H I N O D E R M A T A	53.55	57	26.48	
Yarella blackfordi	23.40	367	11.57	
Bathyrroconger vicinus	17.08	76	8.45	
Stereomastis sp.	10.91	1045	5.39	
Deania calcea	4.90	8	2.43	
THYSANOTEUTHIDAE	4.33	10	2.14	
Hoplostethus cadenati	3.98	82	1.97	
Dicrolene intronigra	3.47	255	1.72	
Stomias boa boa	3.16	92	1.56	
Halosaurus ovenii	2.49	96	1.23	
Talismania longifilis	2.39	35	1.18	
Nesiarachus nasutus	2.29	10	1.14	
S H R I M P S	1.37	255	0.68	
PLATYTROCTIDAE	1.18	6	0.58	
Synaphobranchus kaupii	1.18	16	0.58	
Triplphos hemingi	1.12	92	0.55	
Glyphus marsupialis	0.96	45	0.48	
Malacocephalus laevis	0.92	10	0.46	
Xenodermichthys copei	0.71	45	0.35	
CARISTIIDAE	0.71	6	0.35	
Lophius vaillanti	0.67	6	0.33	
Aristeus varidens, female	0.61	31	0.30	
Etmopterus pusillus	0.33	10	0.16	
ALEPOCEPHALIDAE	0.29	57	0.15	
Scopelosaurus meadi	0.16	6	0.08	
Bathypterois sp	0.16	10	0.08	
Aristeus varidens, male	0.10	16	0.05	
Cataetx laticeps	0.10	25	0.05	
Total	202.18		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 160  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°4.27 Lon E 11°56.52  
 start stop duration Purpose : 3  
 LOG : 3980.00 3981.51 1.5 Region : 4054  
 FDEPTH: 259 269 Gear cond.: 0  
 BDEPTH: 259 269 Validity : 0  
 Towing dir: 0° Wire out : 660 m Speed : 3.0 kn  
 Sorted : 80 Total catch: 165.89 Catch/hour: 333.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	181.51	9750	54.42	
Dentex angolensis	41.32	86	12.39	302
Chlorophthalmus atlanticus	29.86	768	8.95	
Trichiurus lepturus	18.30	117	5.49	
Grammolites gruvelli	14.66	243	4.39	
Bembrops greyi	11.08	282	3.32	
Pterothrissus bellocci	6.41	44	1.92	
Raja clavata	5.15	4	1.54	
Helicolenus dactylopterus	3.76	46	1.13	
Merluccius polli	3.54	82	1.06	303
Malacocephalus laevis	2.49	22	0.75	
Calappa pelii	2.39	68	0.72	
Erotula barbata	1.95	2	0.58	
Peristedion cataphractum	1.55	44	0.46	
Todaropsis eblanae	1.27	8	0.38	
Zenopsis conchifer	1.27	36	0.38	
G A S T R O P O D S	1.23	203	0.37	
Parapenaeus longirostris, male	1.07	139	0.32	
Illex coindetii	0.88	14	0.27	
Starfish	0.78	4	0.24	
MYCTOPHIDAE	0.58	245	0.17	
Parapenaeus longirostris, femal	0.54	88	0.16	
Sepia orbignyana	0.44	4	0.13	
OPHICHTHIDAE	0.40	4	0.12	
Bassanago albescens	0.32	8	0.10	
Ariomma bondi	0.28	8	0.08	
Raja miraletus	0.18	4	0.05	
Gephyroberyx darwini	0.14	4	0.04	
Epigonus telescopus	0.08	10	0.02	
Monolene microstoma	0.08	8	0.02	
PARALEPIDIDAE	0.04	4	0.01	
Total	333.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 159  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°5.40 Lon E 11°56.03  
 start stop duration Purpose : 3  
 LOG : 3969.84 3971.23 1.4 Region : 4054  
 FDEPTH: 315 309 Gear cond.: 0  
 BDEPTH: 315 309 Validity : 0  
 Towing dir: 0° Wire out : 760 m Speed : 2.8 kn  
 Sorted : 38 Total catch: 123.84 Catch/hour: 245.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	109.09	5768	44.50	
Synagrops microlepis	43.45	1522	17.72	
Merluccius polli	40.18	164	16.39	
Trichiurus lepturus	8.83	398	3.60	
Parapenaeus longirostris, female	8.69	1306	3.54	
Helicolenus dactylopterus	6.02	79	2.45	
Pterothrissus bellocci	5.17	34	2.11	
Laemonema laureysi	4.26	65	1.74	
Gadella imberbis	3.66	34	1.49	
GALATHEIDAE	2.61	1247	1.07	
Hymenocephalus italicus	2.36	117	0.96	
Malacocephalus laevis	1.70	14	0.69	
Parapenaeus longirostris, male	1.64	366	0.67	
Stereomastis sp.	1.45	65	0.59	
Peristedion cataphractum	1.05	14	0.43	
Caelorinchus coelorhincus	0.99	26	0.40	
Illex coindetii	0.99	14	0.40	
Chascanopsetta lugubris	0.59	6	0.24	
NETTASTOMATIDAE	0.59	6	0.24	
Parasudis fraser-bruenerri	0.46	26	0.19	
Bassanago albescens	0.46	6	0.19	
Bathynectes piperitus	0.40	6	0.16	
Dibranchus atlanticus	0.26	20	0.10	
Aristeus varidens	0.20	6	0.08	
MYCTOPHIDAE	0.06	40	0.02	
Total	245.15		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 161  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°4.03 Lon E 11°59.84  
 start stop duration Purpose : 3  
 LOG : 3985.88 3987.40 1.5 Region : 4054  
 FDEPTH: 148 152 Gear cond.: 0  
 BDEPTH: 148 152 Validity : 0  
 Towing dir: 0° Wire out : 375 m Speed : 3.0 kn  
 Sorted : 140 Total catch: 139.74 Catch/hour: 277.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	65.01	298	23.40	304
Spicara alta	47.81	459	17.21	
Zenopsis conchifer	25.94	36	9.34	
Erotula barbata	25.25	26	9.09	
Trachurus trecae	24.45	628	8.80	306
Umbrina canariensis	14.61	32	5.26	305
Citharus linguatula	8.53	181	3.07	
Erythrocles monodi	8.45	111	3.04	
Trichiurus lepturus	8.05	14	2.90	
Pterothrissus bellocci	7.20	52	2.59	
Trigla lyza	6.14	58	2.21	
Ariomma bondi	4.39	46	1.58	
Cynoponticus ferox	3.98	4	1.43	
Saurida brasiliensis	3.34	1525	1.20	
Illex coindetii	2.72	87	0.98	
Anthias anthias	2.31	14	0.83	
Atractoscion aequidens	2.21	4	0.79	
Loligo sp.	1.71	646	0.62	
Zeus faber	1.67	6	0.60	
Raja miraletus	1.67	2	0.60	
Peristedion cataphractum	1.63	46	0.59	
Raja alba	1.55	4	0.56	
Lophiodes kempi	1.33	2	0.48	
G A S T R O P O D S	1.29	199	0.47	
Uranoscopus polli	1.29	8	0.47	
Scorpaena stephanica	1.13	2	0.41	
Dentex congoensis	0.87	14	0.31	
Dentex macrocephalus	0.68	2	0.24	
Lagocephalus laevisgatus	0.54	2	0.19	
Dicologlossa cuneata	0.38	6	0.14	
Monolene microstoma	0.36	26	0.13	
Calappa pelii	0.36	2	0.13	
Loligo vulgaris	0.30	2	0.11	
Raja clavata	0.20	2	0.07	
Dibranchus atlanticus	0.20	10	0.07	
Sepia orbignyana	0.20	2	0.07	
Arnoglossus imperialis	0.06	2	0.02	
Total	277.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 162  
 DATE :27.03.2010 GEAR TYPE: BT NO: 23 POSITION:Lat S 7°2.07  
 start stop duration Lon E 12°4.19  
 TIME :08:04:32 08:34:41 30.2 (min) Purpose : 3  
 LOG : 3992.95 3994.58 1.6 Region : 4054  
 FDEPTH: 117 116 Gear cond.: 0  
 BDEPTH: 117 116 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn  
 Sorted : 94 Total catch: 195.54 Catch/hour: 389.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	135.12	1095	34.72	307
Trigla lyra	122.99	991	31.60	
Trachurus trecae	40.40	2149	10.38	309
Dentex congoensis	37.41	629	9.61	308
Spicara alta	8.76	195	2.25	
Brotula barbata	7.26	6	1.87	
Squatina oculata	5.77	4	1.48	
Zeus faber	5.69	20	1.46	
Citharus linguatula	4.06	115	1.04	
Branchiostegus semifasciatus *	3.02	4	0.78	
Fistularia petimba	2.75	8	0.71	
Erythrocles monodi	2.59	36	0.66	
Lophiodes kemp	2.35	4	0.60	
Pterothrissus belloci	2.07	12	0.53	
Dentex barnardi	2.03	4	0.52	
Uranoscopus polli	1.91	8	0.49	
Illex coindetii	1.63	76	0.42	
Echeneis naucrates	1.13	2	0.29	
Ariomma bondi	1.00	20	0.26	
Sepia orbignyana	0.56	16	0.14	
Saurida brasiliensis	0.48	171	0.12	
Arnoglossus imperialis	0.16	24	0.04	
Total	389.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 163  
 DATE :27.03.2010 GEAR TYPE: BT NO: 23 POSITION:Lat S 6°59.23  
 start stop duration Lon E 12°5.57  
 TIME :09:22:34 09:52:48 30.2 (min) Purpose : 3  
 LOG : 3998.26 3999.70 1.4 Region : 4054  
 FDEPTH: 107 109 Gear cond.: 0  
 BDEPTH: 107 109 Validity : 0  
 Towing dir: 0° Wire out : 260 m Speed : 2.8 kn  
 Sorted : 163 Total catch: 163.38 Catch/hour: 324.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	96.36	800	29.72	310
Pagrus auriga	76.51	75	23.60	
Dentex congoensis	50.31	599	15.52	311
Trigla lyra	38.21	284	11.78	
Brotula barbata	12.21	10	3.76	
Squatina oculata	8.24	6	2.54	
Plectorhynchus mediterraneus	7.15	2	2.20	
Priacanthus arenatus	4.92	8	1.52	
Pagellus bellottii	4.98	22	1.51	312
Zeus faber	3.91	16	1.21	
Scorpaena stephanica	3.67	6	1.13	
Dentex barnardi	3.51	8	1.08	
Citharus linguatula	2.94	95	0.91	
Fistularia petimba	2.88	6	0.89	
Trachurus trecae	2.82	149	0.87	313
Raja miraletus	2.52	6	0.78	
Lophiodes kemp	1.21	2	0.37	
Branchiostegus semifasciatus *	0.73	2	0.23	
Trichiurus lepturus	0.46	2	0.14	
Saurida brasiliensis	0.42	73	0.13	
Sepia orbignyana	0.20	10	0.06	
Illex coindetii	0.18	14	0.06	
Arnoglossus imperialis	0.04	6	0.01	
Total	324.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 164  
 DATE :27.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°48.68  
 start stop duration Lon E 12°0.76  
 TIME :11:33:28 12:03:36 30.1 (min) Purpose : 3  
 LOG : 4013.39 4014.86 1.5 Region : 4054  
 FDEPTH: 90 90 Gear cond.: 0  
 BDEPTH: 90 90 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 2.9 kn  
 Sorted : 110 Total catch: 109.87 Catch/hour: 218.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidonichthys gabonensis	170.86	1173	78.09	
Pagellus bellottii	19.71	169	9.01	314
Lepidotrigla cadmani	10.36	78	4.73	
Lagocephalus laevigatus	7.17	4	3.28	
Raja miraletus	4.58	8	2.09	
Dentex barnardi	2.23	2	1.02	
Trachurus trecae	1.17	60	0.54	315
Zeus faber	0.74	2	0.34	
Illex coindetii	0.50	30	0.23	
Citharus linguatula	0.46	16	0.21	
Dentex congoensis	0.42	16	0.19	
Saurida brasiliensis	0.26	94	0.12	
Grammolites gruvelli	0.20	2	0.09	
Sepia orbignyana	0.10	6	0.05	
Arnoglossus imperialis	0.04	2	0.02	
Total	218.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 165  
 DATE :27.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°49.47  
 start stop duration Lon E 11°55.01  
 TIME :14:04:46 14:35:19 30.5 (min) Purpose : 3  
 LOG : 4027.88 4029.18 1.3 Region : 4054  
 FDEPTH: 116 118 Gear cond.: 0  
 BDEPTH: 116 118 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 2.6 kn  
 Sorted : 120 Total catch: 119.99 Catch/hour: 235.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	117.88	452	50.00	316
Dentex congoensis	30.06	306	12.75	318
Trachurus trecae	18.37	418	7.79	317
Squatina oculata	13.95	4	5.92	
Lepidotrigla cadmani	11.94	92	5.07	
Brotula barbata	11.20	12	4.75	
Trichiurus lepturus	6.42	8	2.73	
Zeus faber	6.09	18	2.58	
Raja miraletus	5.50	14	2.33	
Sphoeroides pachgaster	3.01	4	1.28	
Chelidonichthys capensis	2.53	12	1.08	
Scorpaena stephanica	1.73	4	0.73	
Citharus linguatula	1.59	31	0.68	
Spicara alta	1.38	53	0.58	
Priacanthus arenatus	0.88	2	0.38	
G A S T R O P O D S	0.83	47	0.35	
Fistularia petimba	0.75	2	0.32	
Dentex barnardi	0.51	2	0.22	
Pagellus bellottii	0.45	6	0.19	
Illex coindetii	0.26	22	0.11	
Saurida brasiliensis	0.18	71	0.08	
Sepia orbignyana	0.14	6	0.06	
Arnoglossus imperialis	0.06	8	0.03	
Starfish	0.04	2	0.02	
Total	235.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 166  
 DATE :27.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°51.99  
 start stop duration Lon E 11°52.34  
 TIME :15:42:08 16:12:34 30.4 (min) Purpose : 3  
 LOG : 4034.89 4036.36 1.5 Region : 4054  
 FDEPTH: 185 183 Gear cond.: 0  
 BDEPTH: 185 183 Validity : 0  
 Towing dir: 0° Wire out : 450 m Speed : 2.9 kn  
 Sorted : 47 Total catch: 194.03 Catch/hour: 382.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	190.58	9672	49.83	
Dentex angolensis	24.44	87	6.39	319
Umbrina canariensis	19.02	41	4.97	320
Spicara alta	17.74	93	4.64	
Parapenaeus longirostris, femal	17.62	2746	4.61	
Miracorvina angolensis	13.52	45	3.54	
Brotula barbata	11.93	8	3.12	
Trichiurus lepturus	11.71	59	3.06	
G A S T R O P O D S	10.09	840	2.64	
Grammolites gruvelli	8.46	130	2.21	
Illex coindetii	8.46	229	2.21	
Pterothrissus belloci	7.94	85	2.08	
Citharus linguatula	4.95	65	1.29	
Saurida brasiliensis	4.24	1372	1.11	
Zeus faber	3.84	14	1.00	
Torpedo torpedo	3.59	6	0.94	
Cyttopsis roseus	3.51	79	0.92	
Dentex macrophthalmus	3.43	16	0.90	
Lophiodes kemp	3.31	6	0.87	
Parasudis fraser-bruenneri	2.54	20	0.66	
Uranoscopus polli	2.09	14	0.55	
Squatina oculata	1.87	6	0.49	
Parapenaeus longirostris, male	1.70	396	0.44	
Raja miraletus	1.16	6	0.30	
Trigla lyra	0.99	6	0.26	
Monolene microstoma	0.85	51	0.22	
Raja clavata	0.85	6	0.22	
MYCTOPHIDAE	0.51	294	0.13	
Bassanago albescens	0.51	6	0.13	
Loligo sp.	0.34	124	0.09	
Peristedion cataphractum	0.20	6	0.05	
Hymenoccephalus italicus	0.20	20	0.05	
Pontinus accraensis	0.14	6	0.04	
Gobiidae	0.14	6	0.04	
Total	382.45		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 167  
 DATE :27.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°50.77  
 start stop duration Lon E 11°49.58  
 TIME :16:58:06 17:28:08 30.0 (min) Purpose : 3  
 LOG : 4040.88 4042.27 1.4 Region : 4054  
 FDEPTH: 272 267 Gear cond.: 0  
 BDEPTH: 272 267 Validity : 0  
 Towing dir: 0° Wire out : 680 m Speed : 2.8 kn  
 Sorted : 100 Total catch: 401.53 Catch/hour: 801.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	411.05	18136	51.25	
Trichiurus lepturus	158.99	759	19.82	
Chlorophthalmus atlanticus	81.09	2029	10.11	
Parasudis fraser-brueneri	47.46	1063	5.92	
Parapenaeus longirostris, femal	19.81	6703	2.47	
Merluccius polli	14.70	375	1.83	321
Pontinus accraensis	12.54	136	1.56	
L O B S T E R S	10.15	863	1.27	
Pterothrissus belloci	6.07	40	0.76	
Grammolites gruvelli	5.91	104	0.74	
Parapenaeus longirostris, male	5.43	951	0.68	
Todaropsis eblanae	4.55	64	0.57	
Peristedion cataphractum	3.36	208	0.42	
Malacocephalus occidentalis	2.96	24	0.37	
Caelorinchus coelorhincus	2.80	64	0.35	
Epigonus telescopus	2.24	40	0.28	
Zenopsis conchifer	2.20	2	0.27	
Chascanopsetta lugubris	2.08	24	0.26	
Gadella imberbis	1.84	72	0.23	
Calappa sp.	1.44	24	0.18	
MYCTOPHIDAE	1.28	463	0.16	
Dentex angolensis	1.26	4	0.16	
Laemonema laureysi	1.20	16	0.15	
Raja clavata	0.48	24	0.06	
Monolene microstoma	0.32	16	0.04	
Bathyroconger vicinus	0.32	8	0.04	
Cyttopsis roseus	0.16	24	0.02	
Loligo sp.	0.16	40	0.02	
Bathyclupea sp. A	0.16	8	0.02	
Total	801.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 168  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°53.61  
 start stop duration Lon E 11°45.04  
 TIME :19:59:11 20:29:06 29.9 (min) Purpose : 3  
 LOG : 4052.60 4054.04 1.4 Region : 4054  
 FDEPTH: 439 439 Gear cond.: 0  
 BDEPTH: 439 439 Validity : 0  
 Towing dir: 0° Wire out : 1020 m Speed : 2.9 kn  
 Sorted : 19 Total catch: 58.72 Catch/hour: 117.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	50.94	164	43.26	322
Laemonema laureysi	12.99	178	11.04	
Stereomastis sp.	8.12	533	6.90	
Hymenocephalus italicus	6.86	943	5.82	
Aristeus varidens, female	5.96	455	5.06	
Yarella blackfordi	5.49	150	4.67	
Coloconger cadenati	5.13	16	4.36	
Chaunax pictus	5.05	34	4.29	
Shrimps, small, non comm.	4.13	1251	3.51	
OMMASTREPHIDAE	3.65	16	3.10	
Dicrolene intronigra	1.54	114	1.31	
Aristeus varidens, male	1.14	148	0.97	
Lophiodes kemp	1.02	2	0.87	
Malacocephalus occidentalis	1.00	12	0.85	
Lamprogrammus exutus	1.00	4	0.85	
Triplophos hemingi	0.64	90	0.54	
Galeus polli	0.60	8	0.51	
Benthodesmus tenuis	0.46	16	0.39	
Caelorinchus coelorhincus	0.42	18	0.36	
Etmopterus pusillus	0.40	4	0.34	
Stomias boa boa	0.28	6	0.24	
Epigonus telescopus	0.28	4	0.24	
PARALEPIDIDAE	0.18	6	0.15	
MYCTOPHIDAE	0.16	126	0.14	
Dibranchius atlanticus	0.12	12	0.10	
Etmopterus polli	0.08	4	0.07	
Photonectes braueri	0.04	4	0.03	
Nemichthys scolopaceus	0.04	4	0.03	
Total	117.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 169  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°54.48  
 start stop duration Lon E 11°43.19  
 TIME :21:59:28 22:29:06 29.6 (min) Purpose : 3  
 LOG : 4059.89 4061.41 1.5 Region : 4054  
 FDEPTH: 521 528 Gear cond.: 0  
 BDEPTH: 521 528 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 3.1 kn  
 Sorted : 57 Total catch: 57.48 Catch/hour: 116.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	28.55	729	24.53	
Triplophos hemingi	16.40	2225	14.09	
Lamprogrammus exutus	11.79	40	10.13	
Stereomastis sp.	8.50	417	7.31	
Stomias boa boa	8.10	142	6.96	
Nematocarcinus africanus	7.01	2780	6.02	
Merluccius polli	6.68	12	5.74	
Hoplostethus cadenati	5.61	132	4.82	
Aristeus varidens, female	4.33	231	3.72	
Caelorinchus coelorhincus	1.90	26	1.64	
Malacocephalus occidentalis	1.90	14	1.64	
Brotula sp.	1.74	8	1.50	
Laemonema laureysi	1.74	49	1.50	
Chaunax pictus	1.58	20	1.36	
Xenodermichthys copei	1.52	71	1.30	
Aristeus varidens, male	1.44	156	1.24	
Trichiurus lepturus	1.24	12	1.06	
Etmopterus pusillus	1.01	2	0.87	
OMMASTREPHIDAE	0.85	6	0.73	
Hymenocephalus italicus	0.71	87	0.61	
Nezumia leonis	0.65	22	0.56	
Lampadena sp.	0.45	18	0.38	
Halosaurus ovenii	0.36	8	0.31	
Photonectes braueri	0.30	24	0.26	
THYSANOTEUTHIDAE	0.30	2	0.26	
Plesiopeneus edwardsianus	0.30	6	0.26	
Etmopterus polli	0.26	4	0.23	
Acanthephyra sp.	0.26	6	0.23	
CRANCHIIDAE	0.24	6	0.21	
Gadella imberbis	0.16	6	0.14	
Bathynectes piperitus	0.14	2	0.12	
Scopelosaurus meadi	0.10	2	0.09	
Synaphobranchus kaupii	0.08	4	0.07	
Dicrolene intronigra	0.06	6	0.05	
Nemichthys scolopaceus	0.04	6	0.03	
Dibranchius atlanticus	0.04	2	0.03	
MYCTOPHIDAE	0.02	32	0.02	
Total	116.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 170  
 DATE :27.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°58.50  
 start stop duration Lon E 11°40.92  
 TIME :23:59:23 00:32:15 32.9 (min) Purpose : 3  
 LOG : 4069.82 4071.40 1.6 Region : 4054  
 FDEPTH: 718 728 Gear cond.: 0  
 BDEPTH: 718 728 Validity : 0  
 Towing dir: 0° Wire out : 1600 m Speed : 2.9 kn  
 Sorted : 21 Total catch: 67.47 Catch/hour: 123.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	32.53	646	26.41	
Bathyroconger vicinus	15.88	55	12.89	
Stereomastis sp.	15.66	1112	12.72	
Hoplostethus cadenati	13.03	318	10.58	
Nezumia micronychodon	7.56	175	6.14	
Shrimps, small, non comm.	6.68	1095	5.42	
Triplophos hemingi	4.05	602	3.29	
Aristeus varidens, female	3.78	159	3.07	
Ebinania costaecanarie	3.38	2	2.74	
Merluccius polli	2.68	4	2.18	
Dicrolene intronigra	2.46	110	2.00	
Stomias boa boa	2.30	49	1.87	
Deania calcea	2.04	5	1.66	
CARISTIIDAE	1.70	5	1.38	
Halosaurus ovenii	1.26	16	1.02	
Neslarchus nasutus	1.04	5	0.84	
DICERATIIDAE	1.04	5	0.84	
Glyphus marsupialis	1.04	49	0.84	
ALEPOCEPHALIDAE	0.93	88	0.76	
CRANCHIIDAE	0.88	11	0.71	
Aristeus varidens, male	0.66	49	0.53	
Scopelosaurus meadi	0.66	11	0.53	
Xenodermichthys copei	0.49	22	0.40	
Ectreposebastes sp.	0.49	5	0.40	
Bajacalifornia magalops	0.38	11	0.31	
Etmopterus polli	0.33	5	0.27	
PARALEPIDIDAE	0.11	16	0.09	
Bathypterois sp	0.11	5	0.09	
Total	123.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 171  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°42.09  
 start stop duration Lon E 12°8.94  
 TIME :05:31:25 06:01:02 29.6 (min) Purpose : 3  
 LOG : 4108.58 4110.16 1.6 Region : 4054  
 FDEPTH: 69 67 Gear cond.: 0  
 BDEPTH: 69 67 Validity : 0  
 Towing dir: 0° Wire out : 175 m Speed : 3.2 kn  
 Sorted : 99 Total catch: 99.33 Catch/hour: 201.21

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	141.69	97	70.42	
Pagellus bellottii	26.33	261	13.09	324
Scomberomorus tritor	14.48	2	7.20	
Decapterus rhonchus	4.50	4	2.23	
Raja miraletus	3.14	6	1.56	
Euthynnus alletteratus	2.09	2	1.04	
Fistularia petimba	2.01	6	1.00	
Alloteuthis africana	1.52	942	0.76	
Trigla lyra	1.22	6	0.60	
Zeus faber	0.99	2	0.49	
Peristedion cataphractum	0.75	93	0.37	
Pomadasyx incisus	0.73	4	0.36	
Trachinus radiatus	0.57	4	0.28	
Bembrops greyi	0.51	14	0.25	
Sepia orbignyana	0.24	2	0.12	
G A S T R O P O D S	0.18	24	0.09	
Citharus linguatula	0.06	6	0.03	
Raja clavata	0.06	4	0.03	
Illex coindetii	0.06	2	0.03	
Sardinella aurita	0.04	2	0.02	
Arnoglossus imperialis	0.02	4	0.01	
Saurida brasiliensis	0.02	4	0.01	
Total	201.21		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 172  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°37.10  
 start stop duration Lon E 12°14.97  
 TIME :07:16:43 07:46:42 30.0 (min) Purpose : 3  
 LOG : 4119.75 4121.27 1.5 Region : 4054  
 FDEPTH: 44 45 Gear cond.: 0  
 BDEPTH: 44 45 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.0 kn  
 Sorted : 44 Total catch: 44.44 Catch/hour: 88.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	26.72	46	30.04	325
Epinephelus aeneus	21.21	2	23.85	
Pagellus bellottii	10.69	70	12.02	326
Raja miraletus	8.57	26	9.63	
Dasyatis margarita	5.22	6	5.87	
Sepia orbignyana	3.98	6	4.48	
Monolene microstoma	3.86	34	4.34	
Lagocephalus laevigatus	3.36	4	3.78	
Chilomycterus spinosus mauret.	1.34	4	1.51	
G A S T R O P O D S	1.24	2	1.40	
Cynoglossus canariensis	1.00	4	1.13	
Alloteuthis africana	0.66	304	0.74	
Trachinus armatus	0.34	4	0.38	
Citharus linguatula	0.20	8	0.23	
Trachinocephalus myops	0.18	2	0.20	
Bembrops greyi	0.18	4	0.20	
Chaetodon hoeferli	0.14	2	0.16	
Dentex barnardi	0.04	2	0.05	
Total	88.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 173  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°35.63  
 start stop duration Lon E 12°21.75  
 TIME :09:14:02 09:35:15 21.2 (min) Purpose : 3  
 LOG : 4132.47 4133.67 1.2 Region : 4054  
 FDEPTH: 22 23 Gear cond.: 0  
 BDEPTH: 22 23 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.4 kn  
 Sorted : 18 Total catch: 18.00 Catch/hour: 50.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	25.73	158	50.56	327
Raja miraletus	8.14	14	16.00	
Ephippion guttifer	4.52	3	8.89	
Pseudupeneus prayensis	2.46	11	4.83	
Albula vulpes	2.18	6	4.28	
Balistes caprisicus	1.36	3	2.67	
Trichiurus lepturus	1.27	3	2.50	
Caranx sp.	1.13	11	2.22	
Lagocephalus laevigatus	1.07	3	2.11	
Decapterus rhonchus	1.05	11	2.06	
Selene dorsalis	0.96	6	1.89	
Decapterus punctatus	0.51	8	1.00	
G A S T R O P O D S	0.28	68	0.56	
Torpedo torpedo	0.23	3	0.44	
Total	50.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 174  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°22.61  
 start stop duration Lon E 12°8.44  
 TIME :11:52:18 12:23:14 30.9 (min) Purpose : 3  
 LOG : 4152.75 4154.37 1.6 Region : 4054  
 FDEPTH: 41 42 Gear cond.: 0  
 BDEPTH: 41 42 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn  
 Sorted : 9 Total catch: 9.05 Catch/hour: 17.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	9.97	12	56.80	
Pagrus caeruleostictus	2.29	4	13.04	
Pagellus bellottii	1.82	12	10.39	328
Citharus linguatula	0.83	8	4.75	
Trichiurus lepturus	0.78	2	4.42	
Albula vulpes	0.48	2	2.76	
Raja miraletus	0.43	2	2.43	
Selene dorsalis	0.43	2	2.43	
Decapterus punctatus	0.33	4	1.88	
Caranx crysos	0.19	2	1.10	
Total	17.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 175  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°24.67  
 start stop duration Lon E 12°1.22  
 TIME :13:40:02 14:11:50 31.8 (min) Purpose : 3  
 LOG : 4163.44 4165.12 1.7 Region : 4054  
 FDEPTH: 82 82 Gear cond.: 0  
 BDEPTH: 82 82 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 3.2 kn  
 Sorted : 88 Total catch: 87.93 Catch/hour: 165.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	71.23	602	42.93	330
Selene dorsalis	35.28	113	21.27	
Trichiurus lepturus	17.83	32	10.75	
Umbrina canariensis	10.28	25	6.20	
Tromateus fiatola	6.68	6	4.03	
Trachurus trecae	6.15	394	3.71	332
Dentex angolensis	5.79	26	3.49	331
Raja miraletus	2.85	4	1.72	
Torpedo torpedo	2.25	11	1.35	
Fistularia petimba	1.94	6	1.17	
Dentex barnardi	1.62	4	0.98	
Zeus faber	1.08	2	0.65	
Pagellus bellottii	1.00	8	0.60	
Citharus linguatula	0.64	15	0.39	
Uranoscopus cadenati	0.42	2	0.25	
Alloteuthis africana	0.42	155	0.25	
Dentex congoensis	0.32	6	0.19	
Saurida brasiliensis	0.06	11	0.03	
Parapenaeus longirostris	0.04	4	0.02	
Boops boops	0.02	2	0.01	
Arnoglossus imperialis	0.02	4	0.01	
Total	165.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 176  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°27.53  
 start stop duration Lon E 11°58.55  
 TIME :15:05:23 15:35:31 30.1 (min) Purpose : 3  
 LOG : 4170.72 4172.27 1.6 Region : 4054  
 FDEPTH: 97 95 Gear cond.: 0  
 BDEPTH: 97 95 Validity : 0  
 Towing dir: 0° Wire out : 230 m Speed : 3.1 kn  
 Sorted : 94 Total catch: 93.73 Catch/hour: 186.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	50.17	191	26.89	333
Trichiurus lepturus	33.34	78	17.87	
Brachydeuterus auritus	16.51	111	9.92	335
Dentex angolensis	15.59	66	8.35	334
Raja miraletus	9.36	18	5.01	
Brotula barbata	7.66	6	4.11	
Rhinobatos albomaculatus	5.99	2	3.21	
Trachurus trecae	5.79	370	3.10	336
Sepia orbignyana	5.55	32	2.98	
Scorpaena stephanica	4.80	12	2.57	
Pterothrissus belloci	4.66	34	2.50	
Saurida brasiliensis	4.62	82	2.48	
Uranoscopus cadenati	3.72	46	2.00	
Zeus faber	2.91	8	1.56	
Dentex congoensis	2.37	40	1.27	337
Ariomma bondi	2.07	30	1.11	
Selene dorsalis	1.55	4	0.83	
Citharus linguatula	1.51	34	0.81	
Fistularia petimba	1.45	4	0.78	
Torpedo torpedo	1.21	8	0.65	
Pagellus bellottii	0.96	6	0.51	
Cynoglossus canariensis	0.94	2	0.50	
Illex coindetii	0.56	38	0.30	
G A S T R O P O D S	0.46	66	0.25	
Parapenaeus longirostris, femal	0.26	56	0.14	
Starfish	0.22	6	0.12	
Antennarius occidentalis	0.12	4	0.06	
Parapenaeus longirostris, male	0.12	48	0.06	
Arnoglossus imperialis	0.08	10	0.04	
Gobiidae	0.04	4	0.02	
Total	186.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 177  
 DATE :28.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°26.04  
 start stop duration Lon E 11°53.83  
 TIME :16:42:09 17:12:57 30.8 (min) Purpose : 3  
 LOG : 4178.58 4180.12 1.6 Region : 4054  
 FDEPTH: 108 109 Gear cond.: 0  
 BDEPTH: 108 109 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 3.0 kn  
 Sorted : 65 Total catch: 64.66 Catch/hour: 126.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	48.91	156	38.82	
Saurida brasiliensis	12.86	3506	10.21	
Dentex angolensis	9.26	45	7.35	338
Pterothrissus belloci	8.18	47	6.50	
Brotula barbata	7.99	6	6.34	
Umbrina canariensis	6.65	16	5.27	
Trachurus trecae	5.01	285	3.97	339
Mustelus mustelus	4.19	2	3.33	
Branchiostegus semifasciatus *	2.59	2	2.06	
Selene dorsalis	2.42	8	1.92	
Raja miraletus	2.12	6	1.69	
Uranoscopus polli	2.12	27	1.69	
Fistularia petimba	2.10	6	1.67	
Citharus linguatula	1.97	90	1.56	
Ariomma bondi	1.60	31	1.27	
Illex coindetii	1.34	107	1.07	
Brachydeuterus auritus	1.23	6	0.97	
Zeus faber	0.92	6	0.73	
Starfish	0.62	23	0.49	
Pagellus bellottii	0.55	6	0.43	
Parapenaeus longirostris, male	0.47	134	0.37	
Dentex barnardi	0.43	2	0.34	
G A S T R O P O D S	0.41	60	0.32	
Parapenaeus longirostris, femal	0.39	146	0.31	
Octopus vulgaris	0.37	2	0.29	
Dentex congoensis	0.35	4	0.28	
Torpedo torpedo	0.31	2	0.25	
Sepia orbignyana	0.27	12	0.22	
Arnoglossus imperialis	0.12	18	0.09	
GOBIIDAE	0.12	16	0.09	
Lophiodes kempii	0.10	2	0.08	
Helicolenus dactylopterus	0.04	4	0.03	
Total	126.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 178  
 DATE :28.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°34.72  
 start stop duration Lon E 11°38.12  
 TIME :19:44:58 20:15:01 30.1 (min) Purpose : 3  
 LOG : 4200.35 4201.85 1.5 Region : 4054  
 FDEPTH: 337 323 Gear cond.: 0  
 BDEPTH: 337 323 Validity : 0  
 Towing dir: 0° Wire out : 790 m Speed : 3.0 kn  
 Sorted : 41 Total catch: 127.66 Catch/hour: 254.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	112.31	2402	44.06	
Merluccius polli	46.42	144	18.21	340
Parasudis fraser-brueneri	18.15	353	7.12	
Laemonema laureysi	17.37	282	6.81	
Parapenaeus longirostris, femal	8.03	1144	3.15	
Pterothrissus belloci	5.15	30	2.02	
Malacocephalus occidentalis	4.85	42	1.90	
Synagrops microlepis	4.37	120	1.72	
Mystriophis rostellatus	4.19	12	1.64	
Hymenocephalus italicus	3.47	545	1.36	
Epigonus telescopus	3.23	30	1.27	
CHIMAERIDAE	3.15	2	1.24	
Coloconger cadenati	3.01	4	1.18	
Trichiurus lepturus	2.92	4	1.14	
Gephyroberyx darwini	2.80	2	1.10	
Caelorinchus coelorhynchus	2.34	48	0.92	
Benthodesmus tenuis	1.92	90	0.75	
Gadella imberbis	1.80	24	0.70	
CONGRIDAE	1.74	4	0.68	
Parapenaeus longirostris, male	1.26	126	0.49	
L O B S T E R S	1.02	108	0.40	
Chascanopsetta lugubris	0.78	6	0.31	
Apogon sp.	0.72	24	0.28	
Todaropsis eblanae	0.60	6	0.23	
Chaunax pictus	0.54	30	0.21	
Callinectes sp.	0.48	6	0.19	
Dicrolene intronigra	0.48	54	0.19	
Helicolenus dactylopterus	0.36	6	0.14	
Solenocera africana	0.36	48	0.14	
Cytopsis roseus	0.30	12	0.12	
Stereomastis sp.	0.30	18	0.12	
Shrimps, small, non comm.	0.30	78	0.12	
MYCTOPHIDAE	0.18	114	0.07	
Total	254.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 179  
 DATE :28.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°37.54  
 start stop duration Lon E 11°28.27  
 TIME :22:09:37 22:39:03 29.4 (min) Purpose : 3  
 LOG : 4212.80 4214.23 1.4 Region : 4054  
 FDEPTH: 656 662 Gear cond.: 0  
 BDEPTH: 656 662 Validity : 0  
 Towing dir: 0° Wire out : 1365 m Speed : 2.9 kn  
 Sorted : 16 Total catch: 54.44 Catch/hour: 110.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	55.66	11131	50.15	
Yarella blackfordi	8.93	196	8.05	
Merluccius polli	7.79	10	7.02	
Stomias boa boa	7.46	128	6.72	
Centrophorus granulosus	7.24	2	6.52	
Stereomastis sp.	4.89	159	4.41	
Triplophos hemingi	3.49	410	3.14	
OMMASTREPHIDAE	2.81	12	2.53	
Hoplostethus cadenati	2.75	86	2.48	
Xenodermichthys copei	2.51	73	2.26	
Aristeus varidens, female	2.20	98	1.98	
Bathyrucogaster vicinus	0.92	6	0.83	
Dicrolene intronigra	0.80	12	0.72	
Chlorophthalmus atlanticus	0.67	12	0.61	
CRANCHIIDAE	0.49	6	0.44	
Benthodesmus tenuis	0.49	18	0.44	
Bathynectes piperitus	0.37	6	0.33	
Scopelosaurus sp.	0.24	6	0.22	
GALATHEIDAE	0.24	37	0.22	
Ectreposebastes sp.	0.24	6	0.22	
Photonectes braueri	0.24	6	0.22	
CARISTIIDAE	0.18	6	0.17	
Aristeus varidens, male	0.12	18	0.11	
Dibranchius atlanticus	0.12	6	0.11	
Lampadena sp.	0.12	6	0.11	
Total	110.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 180  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°10.93  
 start stop duration Lon E 12°7.93  
 TIME :06:11:06 06:41:04 30.0 (min) Purpose : 3  
 LOG : 4275.00 4276.62 1.6 Region : 4054  
 FDEPTH: 33 32 Gear cond.: 0  
 BDEPTH: 33 32 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn  
 Sorted : 75 Total catch: 75.00 Catch/hour: 150.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	108.47	5878	72.27	341
Selene dorsalis	9.23	118	6.15	
Sardinella aurita	6.08	266	4.05	342
Scomberomorus tritor	4.30	4	2.87	
Sphyraena guachancho	3.60	116	2.40	
Galeoides decadactylus	3.32	38	2.21	
Trichiurus lepturus	2.50	8	1.67	
Pseudotolithus senegalensis	2.18	4	1.45	
Stromateus fiatola	2.18	2	1.45	
Calappa rubroguttata	1.64	18	1.09	
Torpedo torpedo	1.24	4	0.83	
Portunus validus	0.86	2	0.57	
Cynoglossus canariensis	0.74	4	0.49	
Citharus linguatula	0.66	6	0.44	
Fistularia petimba	0.62	2	0.41	
Sepia officinalis hierredda	0.60	2	0.40	
Uranoscopus cadenati	0.60	6	0.40	
Sepia orbignyana	0.32	2	0.21	
Bembrops greyi	0.26	10	0.17	
C R A B S	0.18	32	0.12	
Scorpaena stephanica	0.16	2	0.11	
Ilisha africana	0.14	2	0.09	
Trachinocephalus myops	0.10	2	0.07	
Penaeus notialis	0.10	6	0.07	
Total	150.10		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 181  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°10.51  
 start stop duration Lon E 12°3.27  
 TIME :08:22:57 08:52:59 30.0 (min) Purpose : 3  
 LOG : 4282.71 4284.17 1.5 Region : 4054  
 FDEPTH: 44 42 Gear cond.: 0  
 BDEPTH: 44 42 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 2.9 kn  
 Sorted : 30 Total catch: 30.48 Catch/hour: 60.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	45.05	98	73.98	343
Epinephelus aeneus	4.00	4	6.56	
Pagellus bellottii	3.38	18	5.54	
Selene dorsalis	1.72	12	2.82	
Brachydeuterus auritus	1.58	146	2.59	344
Panulirus regius	1.40	2	2.30	
Fistularia petimba	1.38	4	2.26	
Alloteuthis africana	0.44	208	0.72	
Pseudupeneus prayensis	0.44	2	0.72	
Dentex barnardi	0.44	4	0.72	
Citharus linguatula	0.38	6	0.62	
Sepia officinalis hierredda	0.36	2	0.59	
Bembrops greyi	0.10	8	0.16	
C R A B S	0.08	14	0.13	
Scorpaena stephanica	0.08	2	0.13	
Sardinella aurita	0.06	4	0.10	
Monolene microstoma	0.02	2	0.03	
Total	60.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 182  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°11.19 Lon E 11°55.37  
 start stop duration Purpose : 3  
 TIME :10:00:25 10:30:26 30.0 (min) Region : 4054  
 LOG : 4292.65 4294.05 1.4 Gear cond.: 0  
 FDEPTH: 73 72 Validity : 0  
 BDEPTH: 73 72 Speed : 2.8 kn  
 Towing dir: 0° Wire out : 160 m Catch/hour: 219.29  
 Sorted : 110 Total catch: 109.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	42.97	68	19.60	345
Dentex congoensis	36.38	358	16.59	348
Dentex angolensis	30.48	174	13.90	346
Dentex barnardi	19.89	72	9.07	349
Epinephelus aeneus	18.49	4	8.43	
Trachurus trecae	11.13	708	5.08	350
Brotula barbata	10.99	18	5.01	
Seriola carpenteri	7.20	2	3.28	
Raja miraletus	5.98	8	2.73	
Sepia orbignyana	4.44	14	2.02	
Pagrus caeruleostictus	4.00	6	1.82	
Branchiostegus semifasciatus *	3.82	4	1.74	
Trichurus lepturus	3.72	4	1.70	
Plectorhynchus mediterraneus	3.38	4	1.54	
Pagellus bellottii	3.26	24	1.49	347
Rhinobatos albomaculatus	3.18	2	1.45	
Pagrus africanus	2.40	2	1.09	
Chaetodon hoeferli	2.16	14	0.98	
Pseudupeneus prayensis	1.98	8	0.90	
Zeus faber	1.12	2	0.51	
Chelidonichthys capensis	0.52	2	0.24	
Citharus linguatula	0.52	18	0.24	
Grammolites gruvelli	0.42	10	0.19	
Sargocentron hastatus	0.34	2	0.15	
Illex coindetii	0.16	18	0.07	
Lepidotrigla cadmani	0.12	8	0.05	
Chaetodon marcellae	0.08	2	0.04	
Sardinella aurita	0.08	2	0.04	
Saurida brasiliensis	0.06	14	0.03	
Scorpaena angolensis	0.04	2	0.02	
Arnoglossus imperialis	0.02	4	0.01	
Total	219.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 183  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°14.98 Lon E 11°50.63  
 start stop duration Purpose : 3  
 TIME :12:09:42 12:39:44 30.0 (min) Region : 4054  
 LOG : 4303.85 4305.41 1.6 Gear cond.: 0  
 FDEPTH: 92 93 Validity : 0  
 BDEPTH: 92 93 Speed : 3.1 kn  
 Towing dir: 0° Wire out : 220 m Catch/hour: 818.79  
 Sorted : 179 Total catch: 409.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	309.59	799	37.81	352
Pagellus bellottii	164.33	450	20.07	354
Dentex angolensis	97.46	496	11.90	351
Dentex congoensis	82.96	795	10.13	353
Miracorvina angolensis	71.47	78	8.73	
Epinephelus aeneus	22.98	4	2.81	
Raja miraletus	18.57	32	2.27	
Trachurus trecae	15.07	474	1.84	356
Dentex barnardi	13.19	50	1.61	355
Dentex gibbosus	10.29	10	1.26	
Brotula barbata	6.44	10	0.79	
Pagrus caeruleostictus	2.44	4	0.30	
Chaetodon hoeferli	1.38	10	0.17	
Zeus faber	1.10	4	0.13	
Lepidotrigla cadmani	0.72	46	0.09	
G A S T R O P O D S	0.22	4	0.03	
Citharus linguatula	0.22	10	0.03	
Loligo vulgaris	0.18	4	0.02	
Sepia orbignyana	0.14	4	0.02	
Saurida brasiliensis	0.04	10	0.00	
Total	818.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 184  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°16.59 Lon E 11°45.89  
 start stop duration Purpose : 3  
 TIME :14:02:36 14:33:45 31.2 (min) Region : 4054  
 LOG : 4314.39 4316.06 1.7 Gear cond.: 0  
 FDEPTH: 111 110 Validity : 0  
 BDEPTH: 111 110 Speed : 3.2 kn  
 Towing dir: 0° Wire out : 260 m Catch/hour: 227.87  
 Sorted : 118 Total catch: 118.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	72.98	1656	32.03	360
Dentex angolensis	51.03	289	22.39	357
Dentex congoensis	49.87	510	21.89	359
Lepidotrigla cadmani	18.74	158	8.22	
Pagellus bellottii	10.28	31	4.51	358
Raja miraletus	3.06	6	1.34	
Squatina oculata	2.91	2	1.28	
Branchiostegus semifasciatus *	2.10	2	0.92	
Fistularia petimba	1.83	4	0.80	
Zeus faber	1.69	4	0.74	
Priacanthus arenatus	1.66	4	0.73	
Ariomma bondi	1.52	35	0.67	
Illex coindetii	1.39	69	0.61	
Dentex barnardi	1.35	6	0.59	
Citharus linguatula	1.31	56	0.57	
Saurida brasiliensis	1.25	358	0.55	
Scorpaena stephanica	1.19	2	0.52	
Dentex gibbosus	1.17	2	0.52	
Sepia orbignyana	0.77	25	0.34	
Umbrina canariensis	0.64	2	0.28	
Pagrus caeruleostictus	0.62	2	0.27	
Pterothrissus bellocci	0.29	2	0.13	
Arnoglossus imperialis	0.12	15	0.05	
Monolele microstoma	0.10	17	0.04	
Uranoscopus polli	0.02	2	0.01	
Total	227.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 185  
 DATE :29.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°15.61 Lon E 11°40.03  
 start stop duration Purpose : 3  
 TIME :15:54:28 16:24:28 30.0 (min) Region : 4054  
 LOG : 4322.98 4324.34 1.4 Gear cond.: 0  
 FDEPTH: 119 119 Validity : 0  
 BDEPTH: 119 119 Speed : 2.7 kn  
 Towing dir: 0° Wire out : 280 m Catch/hour: 96.07  
 Sorted : 48 Total catch: 48.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	32.21	220	33.53	361
Dentex congoensis	27.51	398	28.63	363
Branchiostegus semifasciatus *	10.08	10	10.50	
Pagellus bellottii	6.96	60	7.25	362
Spicara alta	6.52	70	6.79	
Trigla lyra	2.78	38	2.89	
Brotula barbata	1.80	2	1.87	
Pagrus africanus	1.42	2	1.48	
Raja miraletus	1.34	2	1.40	
G A S T R O P O D S	0.82	180	0.85	
Lagocephalus laevigatus	0.72	2	0.75	
Ariomma bondi	0.66	8	0.69	
Zeus faber	0.56	2	0.58	
Citharus linguatula	0.50	24	0.52	
Pterothrissus bellocci	0.38	2	0.40	
Sepia orbignyana	0.36	8	0.37	
Chelidonichthys gabonensis	0.32	2	0.33	
Illex coindetii	0.24	12	0.25	
Chaetodon hoeferli	0.20	2	0.21	
Dicologlossa hexophthalma	0.20	4	0.21	
Saurida brasiliensis	0.18	56	0.19	
Arnoglossus imperialis	0.16	28	0.17	
Boops boops	0.14	2	0.15	
Total	96.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 186  
 DATE :29.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°20.58 Lon E 11°28.22  
 start stop duration Purpose : 3  
 TIME :19:20:24 19:50:06 29.7 (min) Region : 4054  
 LOG : 4343.43 4344.93 1.5 Gear cond.: 0  
 FDEPTH: 351 352 Validity : 0  
 BDEPTH: 351 352 Speed : 3.0 kn  
 Towing dir: 0° Wire out : 830 m Catch/hour: 326.27  
 Sorted : 77 Total catch: 161.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	131.67	2662	40.36	
Laemonema laureysi	61.60	848	18.88	
Malacocephalus occidentalis	30.70	210	9.41	
Merluccius polli	28.48	129	8.73	364
Centrophorus granulosus	14.54	2	4.46	
Parapenaeus longirostris, femal	12.68	1717	3.89	
Chaunax pictus	10.30	335	3.16	
Hymenocephalus italicus	6.79	747	2.08	
Epigonus telescopus	6.58	85	2.02	
CONGRIDAE	4.00	28	1.23	
Caelorhynchus caelorhynchus	2.91	101	0.89	
Benthodesmus tenuis	2.26	93	0.69	
Raja alba	2.14	8	0.66	
Etmopterus pusillus	2.02	8	0.62	
Chascanopsetta lugubris	1.66	16	0.51	
Mystriophis rostellatus	1.53	4	0.47	
Bembrops greyi	1.41	32	0.43	
Paraconger notialis	0.77	4	0.24	
Cyttopsis roseus	0.77	12	0.24	
S H R I M P S	0.57	166	0.17	
Parapenaeus longirostris, male	0.53	53	0.16	
Lophiodes kempi	0.36	8	0.11	
Setarches guentheri	0.36	16	0.11	
Synagrops microlepis	0.32	12	0.10	
L O B S T E R S	0.28	40	0.09	
Calappa sp.	0.20	4	0.06	
Aristeus varidens	0.16	24	0.05	
Dibranchius atlanticus	0.16	20	0.05	
Halosaurus ovenii	0.12	4	0.04	
Peristedion cataphractum	0.12	20	0.04	
Dicrolene intronigra	0.12	4	0.04	
MYCTOPHIDAE	0.08	105	0.02	
Solenocera africana	0.08	8	0.02	
Total	326.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 187  
 DATE :29.03.2010 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°26.15  
 start stop duration Lon E 11°16.88  
 TIME :22:53:37 23:13:41 20.1 (min) Purpose : 3  
 LOG : 4365.31 4366.30 1.0 Region : 4054  
 FDEPTH: 756 754 Gear cond.: 0  
 BDEPTH: 756 754 Validity : 0  
 Towing dir: 0° Wire out : 1500 m Speed : 2.9 kn  
 Sorted : 14 Total catch: 14.15 Catch/hour: 42.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia micronychodon	7.32	141	17.31	
HIMANTOLOPHIDAE	4.72	3	11.17	
Stomias boa boa	3.02	63	7.14	
Shrimps, small, non comm.	2.30	359	5.44	
OMMASTREPHIDAE	2.21	6	5.23	
Nezumia sp.	2.18	24	5.16	
Aristeus varidens, female	1.97	75	4.66	
SYNAPHOBORANCHIDAE	1.94	9	4.59	
Stereomastis sp.	1.70	45	4.03	
Yarella blackfordi	1.46	27	3.46	
Xenodermichthys copei	1.38	39	3.25	
CARISTIIDAE	1.32	3	3.11	
Halosaurus owenii	1.26	21	2.97	
Bathygadus melanobranchus	1.08	6	2.54	
Talismania longifiliis	1.02	3	2.40	
Triplophos hemingi	0.96	120	2.26	
Dicrolene intronigra	0.87	21	2.05	
Bathyrcongier vicinus	0.87	3	2.05	
Hoplostethus cadenati	0.84	6	1.98	
Malacocephalus laevis	0.81	6	1.91	
Scopelosaurus meadi	0.57	3	1.34	
Chlorophthalmus atlanticus	0.42	9	0.99	
Acanthephyra sp.	0.30	81	0.71	
Cyrtopsis roseus	0.27	3	0.64	
Epigonus telescopus	0.27	3	0.64	
Lampadena sp.	0.24	3	0.57	
Photonectes braueri	0.21	6	0.49	
Glyphus marsupialis	0.21	12	0.49	
Bembrops greyi	0.21	3	0.49	
Benthodesmus tenuis	0.12	6	0.28	
ALEPOCEPHALIDAE	0.09	3	0.21	
Dibranchius atlanticus	0.06	18	0.14	
MELANOSTOMIATIDAE	0.06	3	0.14	
MYCTOPHIDAE	0.03	0	0.07	
Peristedion cataphractum	0.03	15	0.07	
Total	42.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 188  
 DATE :30.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°33.94  
 start stop duration Lon E 11°41.66  
 TIME :10:18:44 10:48:46 30.0 (min) Purpose : 3  
 LOG : 4438.36 4439.74 1.4 Region : 4054  
 FDEPTH: 228 235 Gear cond.: 0  
 BDEPTH: 228 235 Validity : 0  
 Towing dir: 0° Wire out : 500 m Speed : 2.8 kn  
 Sorted : 76 Total catch: 275.28 Catch/hour: 549.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	234.05	13294	42.57	
Trichiurus lepturus	158.91	1071	28.90	
Dentex angolensis	48.18	130	8.76	365
Zenopsis conchifer	34.87	72	6.34	
Parasudis fraser-brueneri	20.05	993	3.65	
Chlorophthalmus atlanticus	7.47	459	1.36	
Parapenaeus longirostris, male	7.05	0	1.28	
Illex coindetii	6.55	100	1.19	
Epigonus telescopus	6.17	180	1.12	
Parapenaeus longirostris, female	5.53	0	1.01	
Bembrops heterurus	5.53	86	1.01	
Brotula barbata	4.23	8	0.77	
Caelorinchus coelorhincus	3.46	100	0.63	
Uranoscopus polli	2.74	14	0.50	
Lophius vaillanti	2.24	8	0.41	
Todaropsis eblanae	1.94	14	0.35	
Hymenoccephalus italicus	0.44	14	0.08	
Monolene microstoma	0.28	14	0.05	
Dicologlossa cuneata	0.14	8	0.03	
Total	549.83		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 189  
 DATE :30.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°30.57  
 start stop duration Lon E 11°47.86  
 TIME :12:13:50 12:43:53 30.1 (min) Purpose : 3  
 LOG : 4448.66 4450.04 1.4 Region : 4054  
 FDEPTH: 126 126 Gear cond.: 0  
 BDEPTH: 126 126 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 2.7 kn  
 Sorted : 54 Total catch: 53.91 Catch/hour: 107.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	53.49	285	49.71	366
Dentex congoensis	18.46	248	17.16	367
Brotula barbata	5.73	4	5.32	
Squatina oculata	5.59	2	5.19	
Lepidotrigla cadmani	5.27	88	4.90	
Mustelus mustelus	3.89	2	3.62	
Citharus linguatula	2.00	84	1.85	
Illex coindetii	1.68	0	1.56	
Octopus vulgaris	1.42	4	1.32	
Trachurus trecae	1.40	36	1.30	368
G A S T R O P O D S	1.22	104	1.13	
Uranoscopus polli	0.96	6	0.89	
Spicara alta	0.88	22	0.82	
Zenopsis conchifer	0.88	2	0.82	
Zeus faber	0.82	2	0.76	
Sepia orbignyana	0.70	6	0.65	
Peristedion cataphractum	0.62	12	0.58	
Dicologlossa hexophtalma	0.42	10	0.39	
Lophius vaillanti	0.40	2	0.37	
Ariomma bondi	0.40	8	0.37	
Saurida brasiliensis	0.40	140	0.37	
Trichiurus lepturus	0.24	2	0.22	
Bembrops heterurus	0.24	4	0.22	
Monolene microstoma	0.16	14	0.15	
Dicologlossa cuneata	0.14	2	0.13	
UNIDENTIFIED FISH	0.14	4	0.13	
Arnoglossus imperialis	0.08	14	0.07	
Total	107.60		100.00	

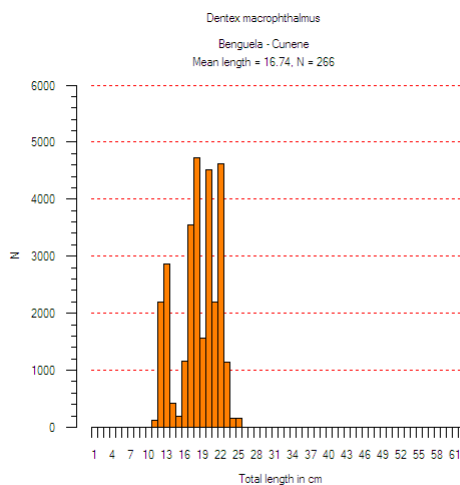
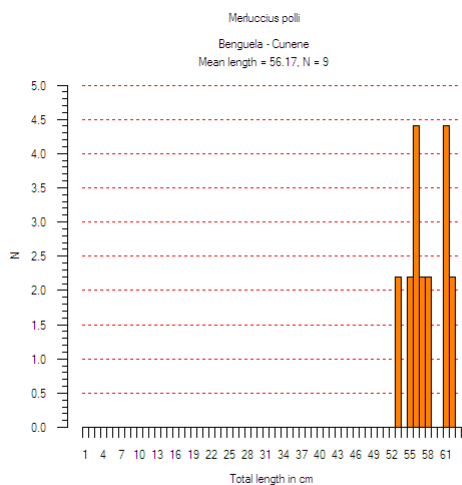
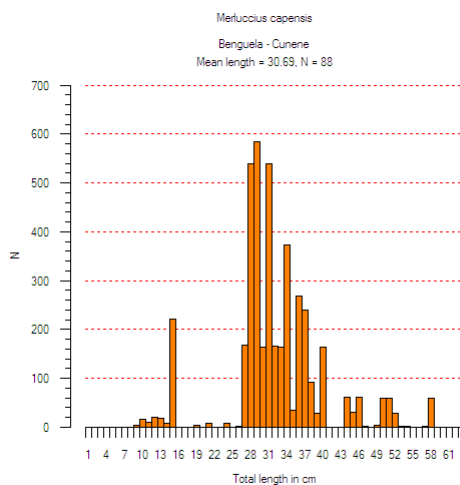
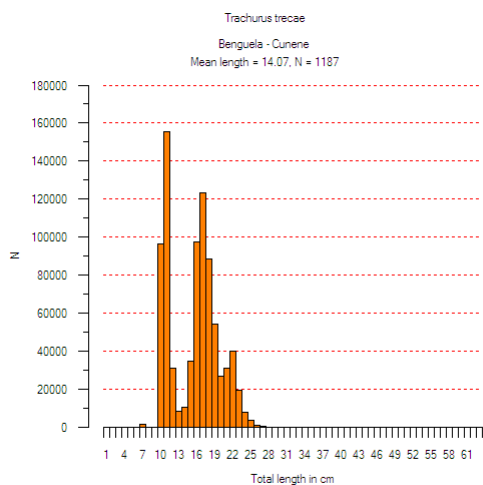
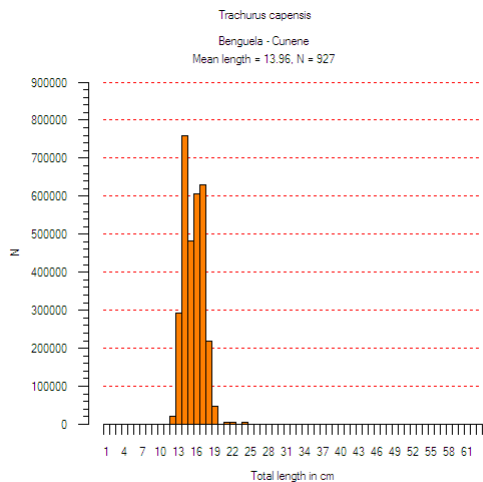
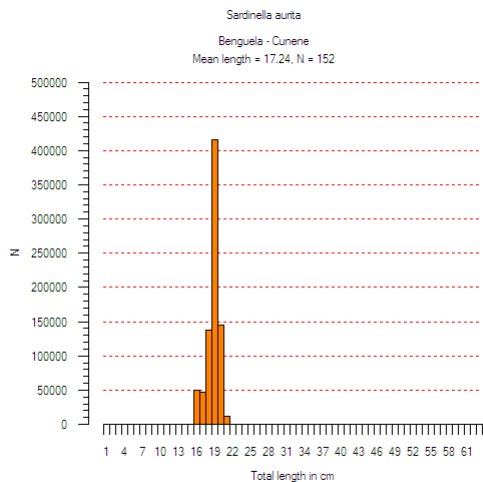
R/V Dr. Fridtjof Nansen SURVEY:2010402 STATION: 190  
 DATE :30.03.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°29.45  
 start stop duration Lon E 11°52.31  
 TIME :13:47:30 14:18:19 30.8 (min) Purpose : 3  
 LOG : 4456.13 4457.56 1.4 Region : 4054  
 FDEPTH: 116 116 Gear cond.: 0  
 BDEPTH: 116 116 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 2.8 kn  
 Sorted : 55 Total catch: 54.81 Catch/hour: 106.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	19.08	93	17.88	369
Lepidotrigla cadmani	16.65	228	15.60	
Trachurus trecae	15.09	609	14.14	371
Squatina oculata	11.68	2	10.95	
Selene dorsalis	11.04	39	10.34	
Dentex congoensis	4.44	55	4.16	370
Branchiostegus semifasciatus *	3.17	2	2.97	
Citharus linguatula	3.15	105	2.96	
Dentex barnardi	2.49	10	2.34	
Saurida brasiliensis	2.41	849	2.26	
Pterothrissus belloci	2.02	12	1.90	
Octopus vulgaris	1.87	6	1.75	
Lophius vaillanti	1.56	4	1.46	
G A S T R O P O D S	1.36	160	1.28	
Torpedo torpedo	1.30	4	1.22	
Illex coindetii	1.21	72	1.13	
Scorpaena stephanica	1.19	2	1.11	
Zenopsis conchifer	1.03	2	0.97	
Ariomma bondi	0.99	18	0.93	
Raja miraletus	0.91	4	0.86	
Trichiurus lepturus	0.74	2	0.69	
Priacanthus arenatus	0.68	2	0.64	
Sepia orbignyana	0.39	8	0.36	
Pagellus bellottii	0.35	6	0.33	
Zeus faber	0.35	2	0.33	
Arnoglossus imperialis	0.33	33	0.31	
Monolene microstoma	0.29	18	0.27	
Todaropsis eblanae	0.25	2	0.24	
Uranoscopus polli	0.18	2	0.16	
Parapenaeus longirostris	0.16	31	0.15	
Dicologlossa hexophtalma	0.16	2	0.15	
Peristedion cataphractum	0.12	2	0.11	
Calappa pelii	0.04	2	0.04	
Gobiidae	0.02	2	0.02	
Total	106.70		100.00	

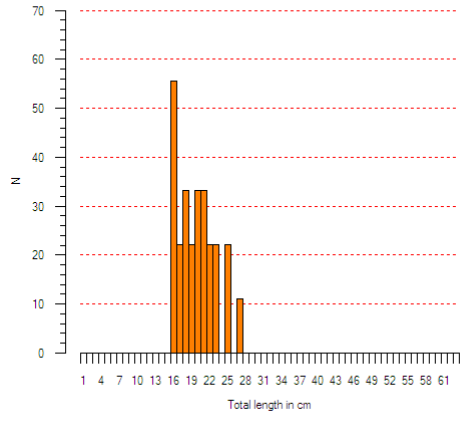
## ANNEX II. Length distribution of main species.

### Southern Angola

Pooled length frequency distribution of the main species weighted by the catch

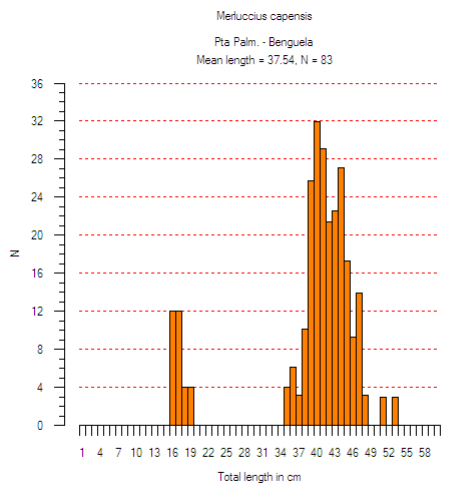
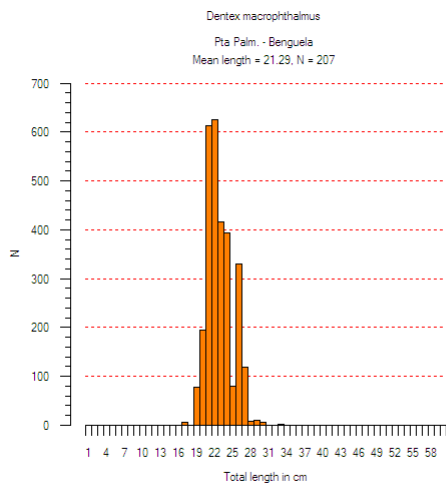
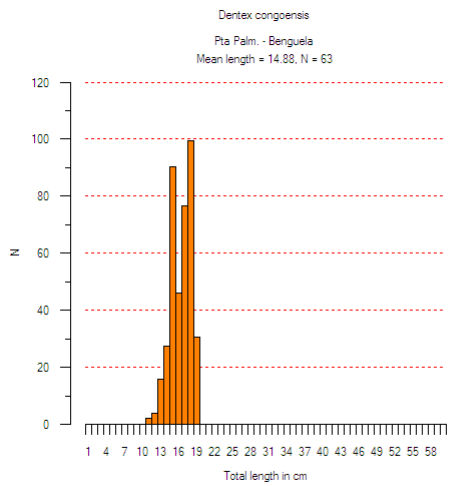
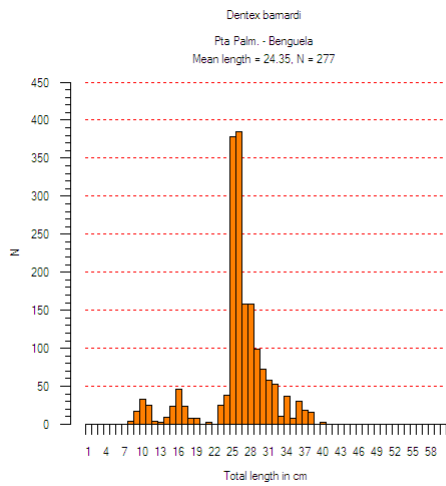
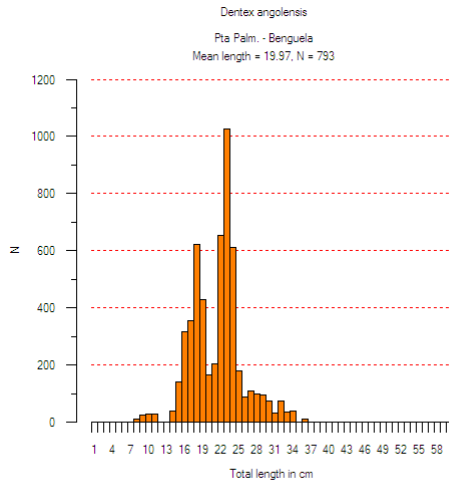
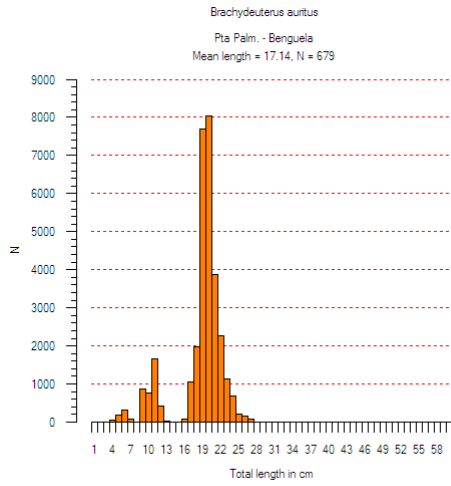


Pagellus bellotti  
Benguela - Cunene  
Mean length = 18.34, N = 25

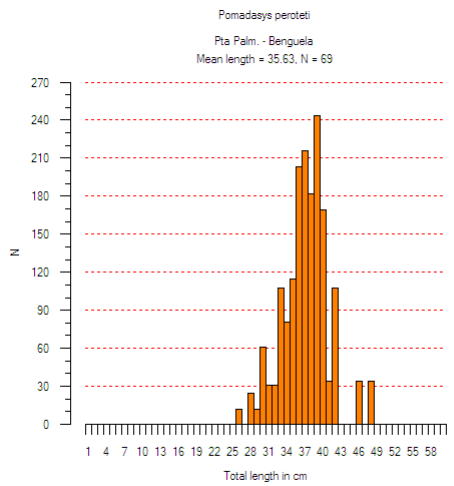
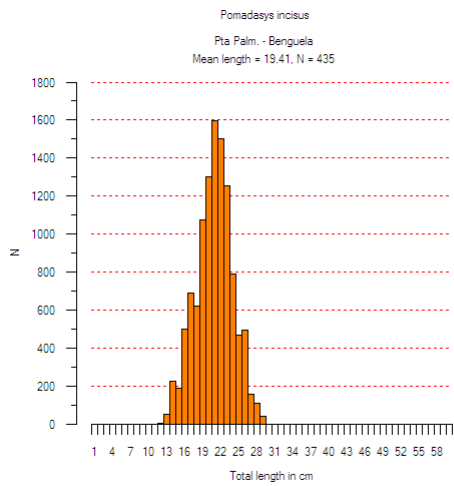
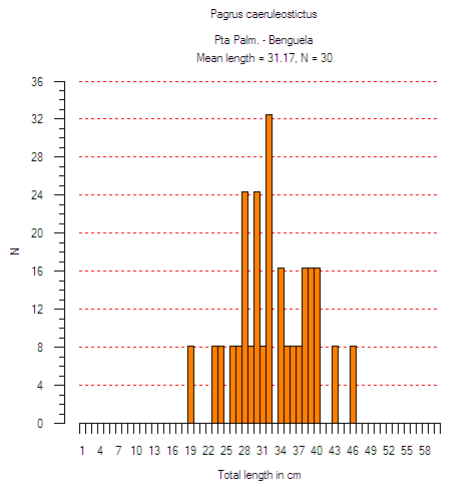
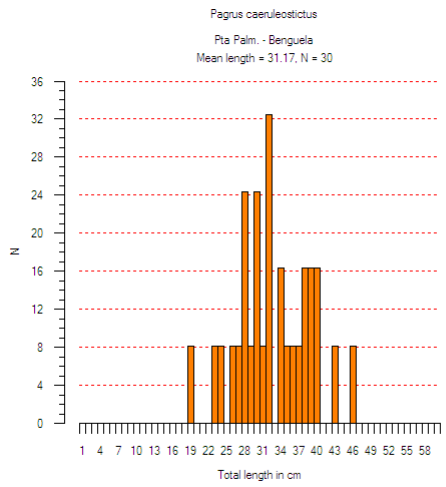
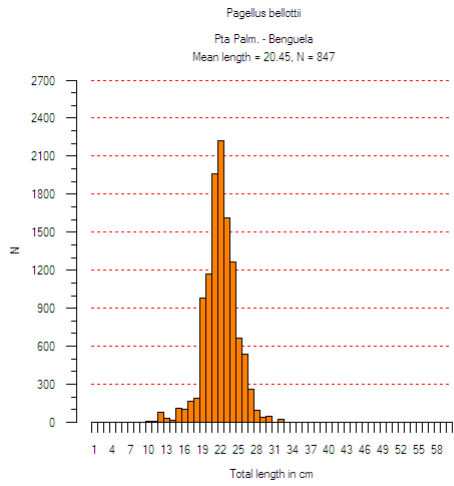
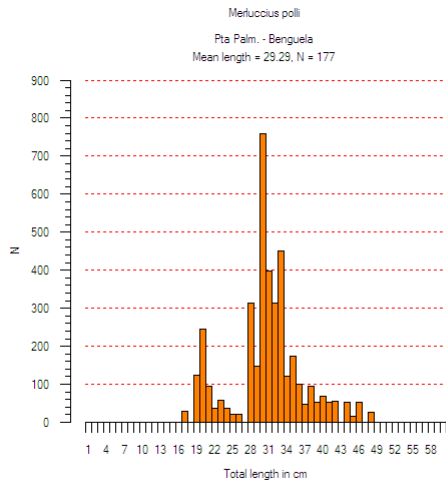


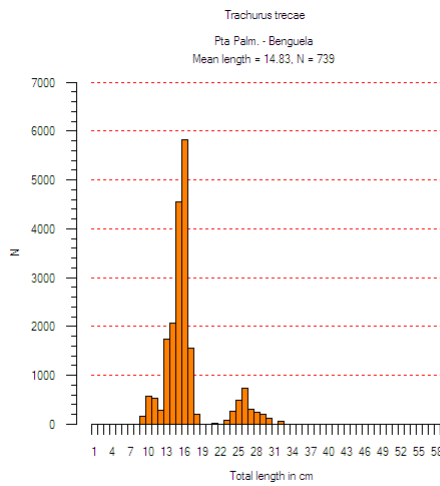
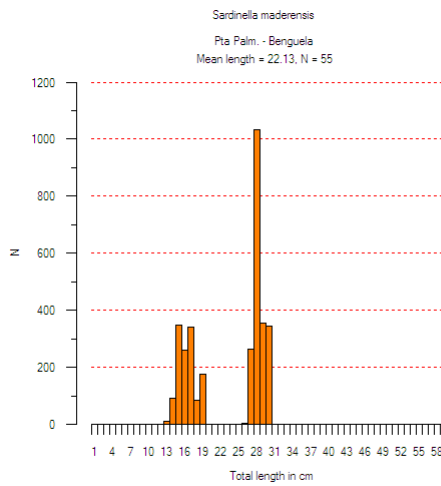
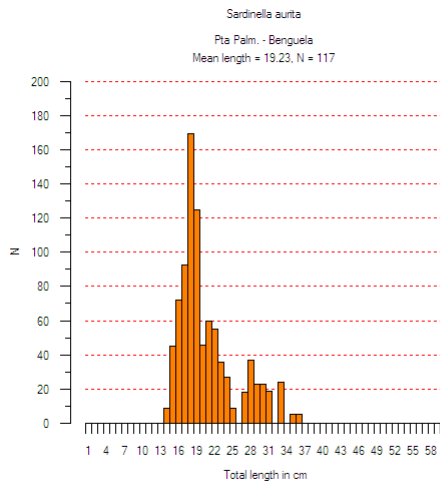
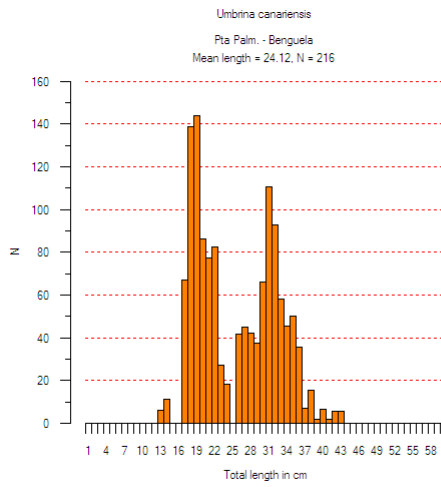
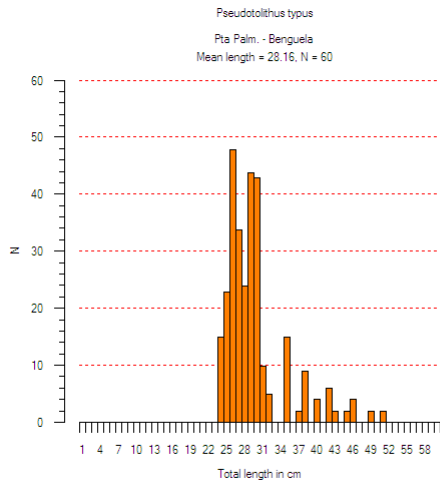
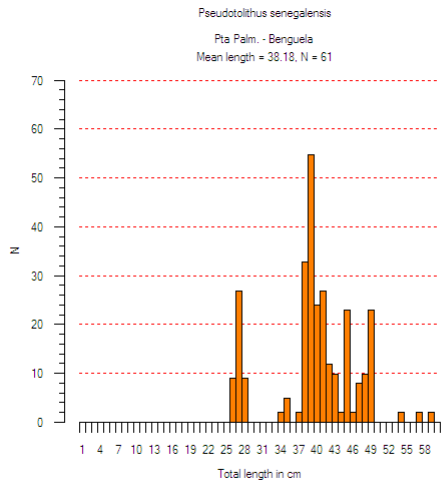
# Central Angola

Pooled length frequency distribution of the main species weighted by the catch



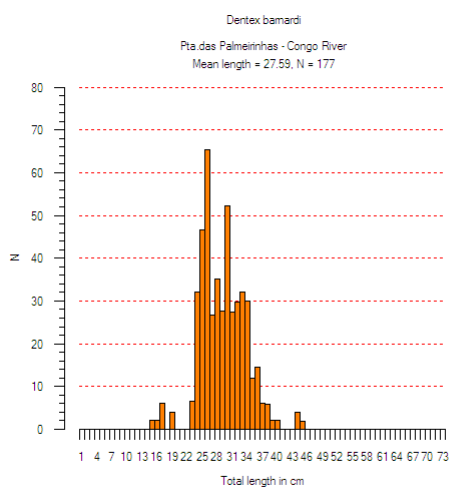
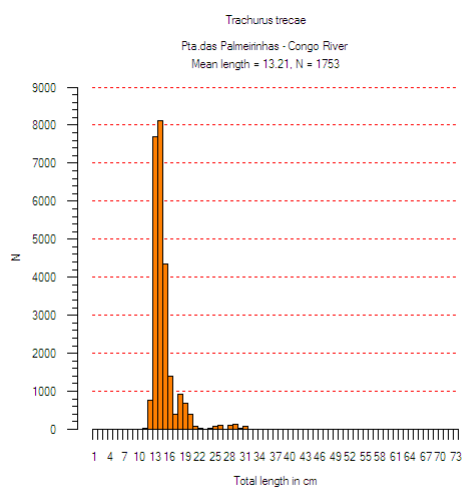
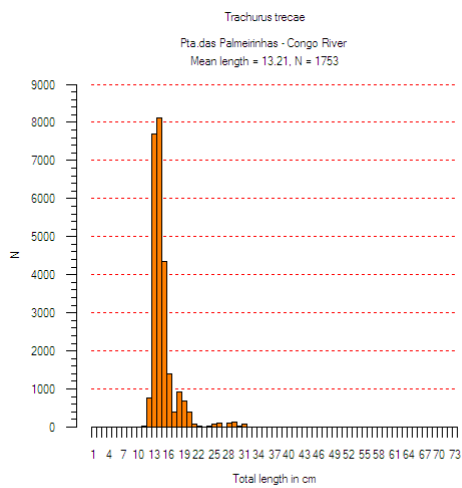
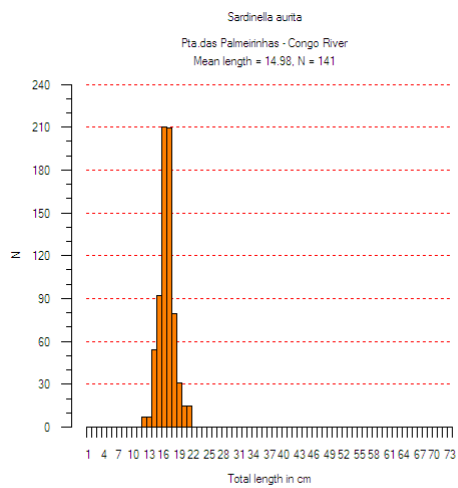
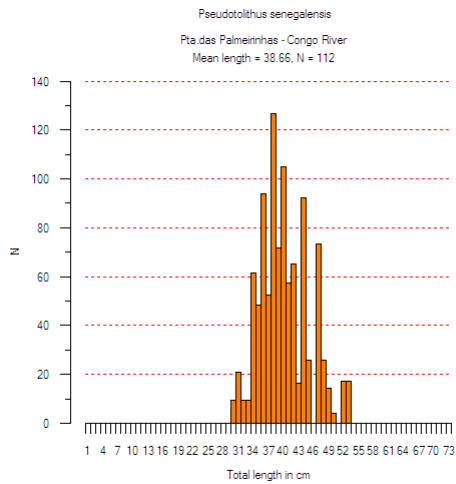
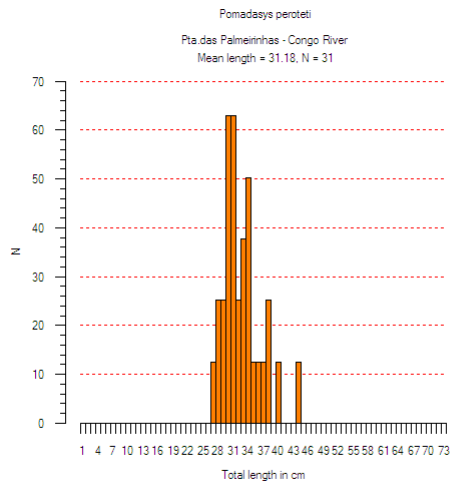


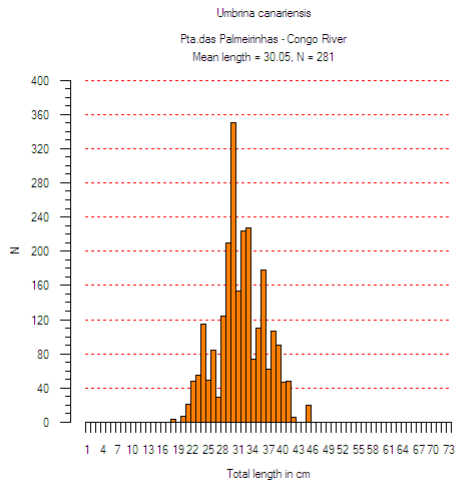
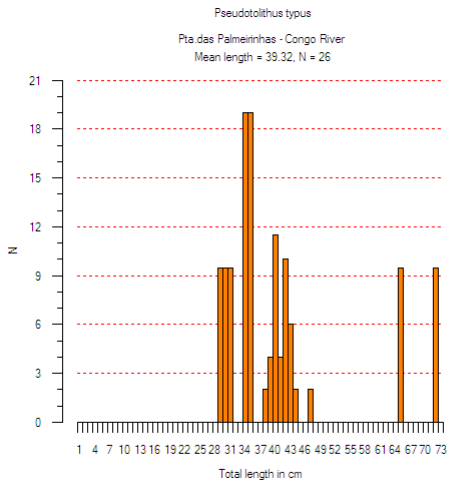
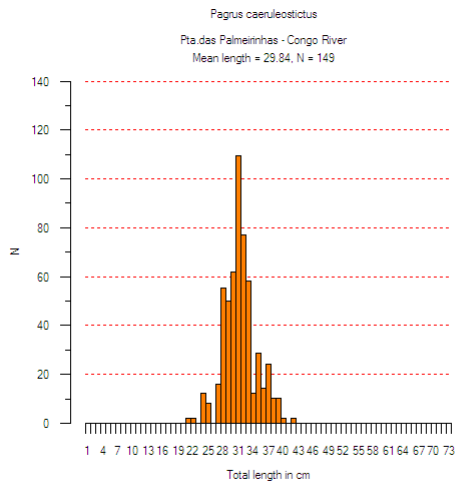
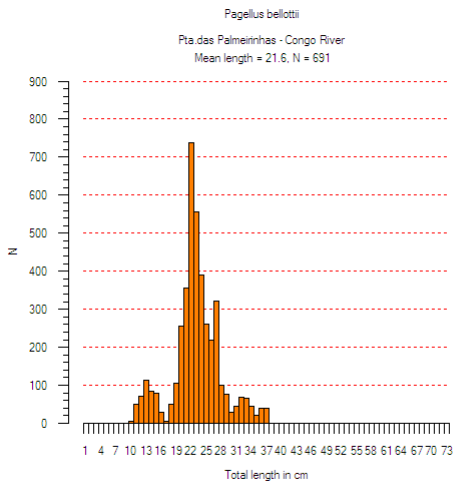
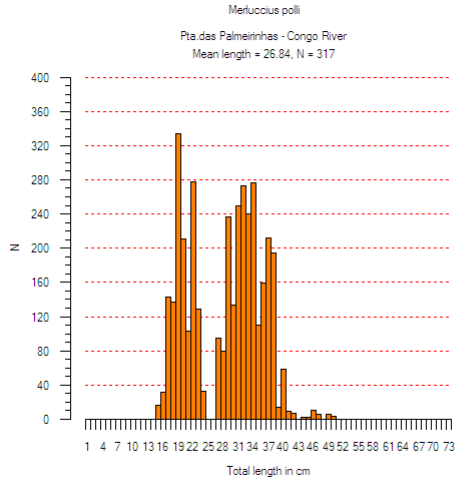
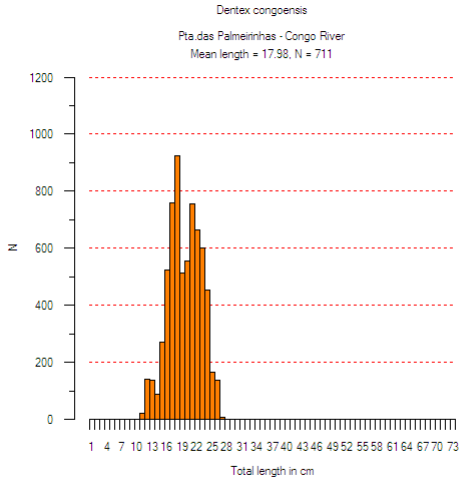




## Northern Angola

Pooled length frequency distribution of the main species weighted by the catch





## ANNEX III. Swept area estimates

### A.- Cunene – Tombua. Shelf (20-200m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata		
	Lower limits, Kg/nm								20-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Trachurus capensis		1		1		6	40	134.502	116.985	5.807	246.445
Sardinella aurita					1	2	15	67.647	169.118		
Trachurus trecae	2	2	2	1	5	2	70	39.892	21.032	76.029	35.634
J E L L Y F I S H		1	3	1	3	1	45	19.005	43.6	2.963	2.356
Engraulis encrasicolus	1			1		1	15	9.152	22.88		
Dentex macrophthalmus	2	1	1	5			45	4.689		0.908	12.748
Sardinops ocellatus	1		1	1			15	1.633	4.082		
Starfish	6	1	1	2			50	1.518	2.993	1.283	
Merluccius capensis	3	2	1	1			35	1.462		0.06	4.136
Synagrops microlepis	1		1	1			15	1.243			3.552
Chelidonichthys capensis	1		2	1			20	1.134	2.121	0.137	0.718
Etrumeus whiteheadi	1			1			10	0.891	2.19		0.042
Loligo vulgaris	4	2		1			35	0.743	1.753	0.124	0.03
Arius parkii	2	1		1			20	0.629	1.528		0.051
Lithognathus mormyrus				1			5	0.588	1.469		
Scomber japonicus	5		1				30	0.412	0.854	0.284	
Sepia orbignyana	5	4					45	0.397	0.639	0.56	0.004
Trigla lyra	3	1	1				25	0.312			0.891
Zeus faber	3	3					30	0.308	0.008	0.51	0.506
Dicologlossa cuneata	14	1					75	0.306	0.428	0.071	0.335
G A S T R O P O D S	6		1				35	0.299		0.478	0.514
Argyrosomus hololepidotus	1	1					10	0.13	0.325		
Trichiurus lepturus	1	1					10	0.108	0.202		0.076
Spondyliosoma cantharus	5						25	0.104	0.013	0.201	0.138
Raja miraletus	2	1					15	0.092	0.025	0.328	
Sea cucumber		1					5	0.084	0.211		
Umbrina canariensis	2	1					15	0.078	0.195		
Mustelus mustelus	4						20	0.069	0.098	0.121	
Pteromylaeus bovinus		1					5	0.069	0.173		
Maja squinado	7						35	0.058	0.143	0.003	
Chelidonichthys lastoviza		1					5	0.05		0.201	
Gymnura micrura	1						5	0.049	0.123		
B I V A L V E S	2						10	0.048	0.01		0.126
Gymnura altavela	1						5	0.043	0.108		
Anthias anthias	1						5	0.043			0.122
Scorpaena stephanica	2						10	0.038		0.056	0.068
Pagellus bellottii	1						5	0.037		0.149	
Squalus megalops	3						15	0.036		0.044	0.071
Atractoscion aequidens	2						10	0.036	0.023		0.076
GOBIIDAE	4						20	0.036	0.071	0.004	0.017
Pterothrissus belloci	4						20	0.034		0.027	0.076
Illex coindetii	4						20	0.032	0.068	0.019	
Myliobatis aquila	1						5	0.03	0.074		
Squilla mantis	6						30	0.026	0.007	0.074	0.012
Dasyatis marmorata	1						5	0.025		0.101	
Dentex barnardi	1						5	0.025		0.099	
Octopus vulgaris	3						15	0.024		0.002	0.066
trachurus trecae, Juvenile	1						5	0.019	0.047		
Trachinus sp.	1						5	0.014	0.034		
Brotula barbata	4						20	0.013		0.03	0.015
Parapandalus narval	1						5				
Other fish								0.07	0.085	0.085	0.042
Sum all species								288.279	393.714	90.76	308.869
Sum CROAKERS, DRUMS, WEAKF., KOB								0.244	0.543		0.076
Sum PANDORAS, PORGIES, SEABREAMS,								5.442	1.483	1.357	12.886
Sum SHARKS, CHIMAERAS								0.105	0.098	0.165	0.071
Sum BATOID FISHES, RAYS								0.317	0.525	0.429	
Sum CEPHALOPODS								1.201	2.473	0.706	0.1
Numbers of stations included in analysis, total and by depth strata								20	8	5	7

## B.- Cunene - Tombua. Slope (200-500m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								200-300m	300-400m	400-500m
	>0	10	30	100	300	1000					
Helicolenus dactylopterus					1		50	36.833		36.833	
Merluccius capensis			1	1			100	8.84		8.84	
Trachurus capensis			1				50	3.486		3.486	
Hoplostethus cadenati			1				50	3.069		3.069	
S H R I M P S			1				50	2.014		2.014	
Chlorophthalmus atlanticus			1				50	1.968		1.968	
Hymenocephalus italicus	1	1					100	0.907		0.907	
Pontinus accraensis			1				50	0.854		0.854	
Laemonema globiceps			1				50	0.753		0.753	
Nezumia sp.			1				50	0.742		0.742	
Aristeus varidens, female			1				50	0.614		0.614	
Gadella maraldi			1				50	0.59		0.59	
Pterothrissus belloci	2						100	0.506		0.506	
Caelorinchus sp.	1						50	0.478		0.478	
Malacocephalus laevis	1						50	0.231		0.231	
Aristeus varidens, male	1						50	0.128		0.128	
Raja alba	1						50	0.119		0.119	
Sardinops ocellatus	1						50	0.108		0.108	
Loligo vulgaris	1						50	0.106		0.106	
Lophius vomerinus	1						50	0.067		0.067	
Lophiodes kempfi	1						50	0.048		0.048	
OMMASTREPHIDAE	1						50	0.031		0.031	
Galeus polli	1						50	0.016		0.016	
Callinectes amnicola	1						50	0.011		0.011	
Parapandalus narval	1						50	0.004		0.004	
Plesiopenaeus edwardsianus	1						50				
Other fish								0.008	0	0.008	0
Sum all species								62.53	0	62.53	0
Sum SHARKS, CHIMAERAS								0.016		0.016	
Sum BATOID FISHES, RAYS								0.119		0.119	
Sum CEPHALOPODS								0.137		0.137	
Numbers of stations included in analysis, total and by depth strata								2	0	2	0

## C.- Cunene - Tombua. Slope (500-800m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								500-600m	600-700m	700-800m
	>0	10	30	100	300	1000					
Nezumia leonis			1				33.33	2.937		4.406	
Nezumia micronychodon		1	1				66.67	1.924		2.886	
Trachurus capensis	1		1				66.67	1.877		2.815	
Trachyrincus scabrus	2		1				100	1.745	3.616	0.809	
Hymenocephalus italicus			1				33.33	1.223	3.669		
Hoplostethus cadenati	2	1					100	0.933	2.679	0.06	
Talimania longifilis	2	1					100	0.721	1.714	0.224	
Nezumia sp.		1					33.33	0.631		0.946	
OMMASTREPHIDAE	2	1					100	0.592	1.353	0.212	
Centrophorus squamosus		1					33.33	0.574	1.721		
Aristeus varidens, female	1	1					66.67	0.455	1.334	0.015	
Helicolenus dactylopterus			1				33.33	0.391	1.173		
Yarella blackfordi	3						100	0.349	0.785	0.131	
Deania calcea	2						66.67	0.335	0.729	0.139	
Merluccius polli	1						33.33	0.256	0.768		
Merluccius capensis	2						66.67	0.226	0.525	0.077	
Ebinania costaeacarie	2						66.67	0.18	0.158	0.191	
Bajacalifornia magalops	1						33.33	0.17	0.509		
S H R I M P S	1						33.33	0.16	0.479		
Lamprogrammus exutus	3						100	0.138	0.265	0.074	
Lophius vomerinus	1						33.33	0.111		0.167	
Lophiodes kempfi	1						33.33	0.052		0.078	
Tetragonurus cuvieri	2						66.67	0.047		0.07	
HOLUTHUROIDEA	1						33.33	0.046		0.069	
Chaceon maritae, female	1						33.33	0.046	0.139		
Paramola cuvieri	1						33.33	0.046		0.069	
Stomias boa boa	2						66.67	0.041	0.037	0.043	
Chaceon maritae, male	1						33.33	0.041	0.122		
Lycodes agulhensis	1						33.33	0.037		0.056	
Raja miraletus	1						33.33	0.032		0.048	

JELLYFISH	1	33.33	0.029		0.043
Phrynichthys wedli	1	33.33	0.028		0.042
Aristeus varidens, male	2	66.67	0.025	0.059	0.008
Gonostoma denudata	1	33.33	0.021		0.031
Chaceon maritae	1	33.33	0.019		0.029
Synaphobranchus kaupii	2	66.67	0.018	0.032	0.011
Bathyroconger vicinus	1	33.33	0.018	0.054	
Raja confundens	1	33.33	0.018		0.027
Benthodesmus tenuis	2	66.67	0.017		0.025
Halosaurus ovenii	1	33.33	0.014	0.043	
Nemichthys scolopaceus	2	66.67	0.012		0.018
Bathyraya sp.	1	33.33	0.01		0.015
Heterocarpus ensifer	1	33.33	0.005	0.016	
Heterocarpus grimaldii	1	33.33	0.002		0.004
Aristeus varidens	1	33.33	0.002		0.003
Parapenaeus longirostris	1	33.33			0.001
Other fish			0.047	0	0.048
Sum all species			16.6	0	22.024
Sum SHARKS, CHIMAERAS			0.909		2.45
Sum BATOID FISHES, RAYS			0.064		0.096
Sum CEPHALOPODS			0.592		1.353
Numbers of stations included in analysis, total and by depth strata			3		

A. Benguela - Palmerinhas. Shelf (20-200m)

SPECIES NAME	Lower limits, Kg/nm						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	>0	10	30	100	300	1000			0-20m	20-50m	50-100m	100-200m
Chloroscombrus chrysurus	5	1				1	14.89	2.85	8.371			
Brachydeuterus auritus	15	2	8		1		55.32	2.027	0.917	4.312	0.229	
Trichiurus lepturus	18	5	8	1			68.09	1.688	0.746	2.338	1.948	
Pagellus bellottii	20	10	4				72.34	1.023	0.666	1.931	0.206	
Pomadasys incisus	9	4	4	1			38.3	0.958	0.308	2.228		
Pomadasys peroteti		2	2		1		10.64	0.921	2.282	0.376		
Synagrops microlepis	3		5	1			19.15	0.77		0.48	2.119	
MYCTOPHIDAE	1			1			4.26	0.61			2.206	
Trachurus trecae	21	2	4				57.45	0.586	0.311	1.171	0.113	
Raja miraletus	38	6					93.62	0.527	0.427	0.871	0.173	
Pseudupeneus prayensis	12	3	1	1			36.17	0.472	0.773	0.544		
Dentex angolensis	17	5	1				48.94	0.457		0.321	1.208	
Citharus linguatula	34	6					85.11	0.416	0.033	0.876	0.25	
Galeoides decadactylus	10	1	2				27.66	0.368	0.965	0.101	0.003	
Decapterus rhonchus	2		2				8.51	0.363	1.067			
Trigla lyra	14	4	1				40.43	0.333	0.001	0.32	0.76	
Brotula barbata	15	5					42.55	0.298	0.002	0.23	0.756	
Sardinella maderensis	5			1			12.77	0.295	0.864	0.002		
Dentex barnardi	18	1	2				44.68	0.292	0.275	0.251	0.371	
Rhinobatos albomaculatus	15	2	1				38.3	0.273	0.561	0.214		
Umbrina canariensis	22		1				48.94	0.232	0.029	0.229	0.488	
Alectis alexandrinus	7	2	1				21.28	0.214	0.576	0.046		
Pteroscion peli	1	2	1				8.51	0.19	0.557			
Sepia orbignyana	38	1					82.98	0.183	0.045	0.361	0.105	
Pterothrissus belloci	13	2					31.91	0.148	0.001	0.049	0.468	
Grammolites gruevi	23	2					53.19	0.141	0.056	0.318		
Pseudolithus senegalensis	3	2					10.64	0.131	0.177	0.184		
Torpedo torpedo	21		1				46.81	0.13	0.025	0.275	0.059	
Zeus faber	19						40.43	0.116		0.191	0.156	
Dentex macrophthalmus	6	2					17.02	0.113		0.044	0.349	
Octopus vulgaris	18	1					40.43	0.105	0.031	0.174	0.102	
Pomadasys rogeri	5		1				12.77	0.103	0.259	0.038		
Pomadasys jubelini	8	1					19.15	0.099	0.058	0.208		
Ephippion guttifer	9						19.15	0.096	0.238	0.04		
Ilisha africana	2		1				6.38	0.093	0.273			
Dasyatis marmorata	4		1				10.64	0.091	0.226	0.036		
Gymnura micrura	2	2					8.51	0.088	0.171	0.078		
G A S T R O P O D S	20						42.55	0.088	0.101	0.044	0.132	
Merluccius capensis	4	1					10.64	0.085		0.111	0.153	
Lagocephalus laevigatus	16	1					36.17	0.082	0.019	0.05	0.202	
Pagrus caeruleostictus			1				2.13	0.081	0.239			
Sphyrna guachancho	6	1					14.89	0.078	0.164	0.056		
Lithognathus mormyrus	7	1					17.02	0.076	0.162	0.056		
Selene dorsalis	11						23.4	0.076	0.061	0.145		
Epinephelus aeneus	4	1					10.64	0.072	0.12	0.082		
Pseudolithus typus	7	1					17.02	0.071	0.162	0.04		
Balistes capriscus	3	1					8.51	0.071	0.207			
Anthias anthias	2	1					6.38	0.064			0.233	
Sardinella aurita	7	1					17.02	0.063	0.177	0.008		
Chelidonichthys capensis	4	1					10.64	0.062		0.161	0.002	
Erythrocles monodi		1					2.13	0.059			0.212	
Torpedo marmorata	9	1					21.28	0.054	0.118	0.037		
Drepane africana	1	1					4.26	0.052	0.154			
Alloteuthis africana	21						44.68	0.052	0.011	0.112	0.017	
Scorpaena normani	9	1					21.28	0.042		0.012	0.136	
Dasyatis margarita	7						14.89	0.039	0.114			
Illex coindetii	16						34.04	0.038		0.052	0.065	
Chilomycterus spinosus mauret.	15						31.91	0.036	0.076	0.026		
Stromateus fiatola	4						8.51	0.035	0.096		0.009	
Lepidochelys olivacea		1					2.13	0.035			0.127	
Dicologlossa cuneata	13						27.66	0.034	0.084	0.015		
Pontinus accraensis	10						21.28	0.034	0.001	0.029	0.081	
Atractoscion aequidens	5						10.64	0.032	0.008	0.025	0.07	
Cynoglossus canariensis	12						25.53	0.032	0.089	0.003		



Cynoponticus ferox	5	10.64	0.029	0.02		0.081
Squatina oculata	4	8.51	0.029		0.068	0.011
Bembrops greyi	9	19.15	0.029	0.001		0.103
Uranoscopus polli	6	12.77	0.029		0.031	0.061
Sphyaena sphyaena	4	8.51	0.027	0.079		
Saurida brasiliensis	14	29.79	0.026	0.004	0.019	0.062
Fistularia petimba	12	25.53	0.026	0.011	0.045	0.017
Uranoscopus cadenati	8	17.02	0.024	0.001	0.027	0.048
Parapenaeus longirostris, femal	6	12.77	0.021		0.014	0.057
Lepidotrigla cadmani	1	2.13	0.02		0.052	
Chaetodon hoefleri	14	29.79	0.02	0.01	0.037	0.007
Caranx crysos	5	10.64	0.019	0.034	0.02	
Perulibatrachus rosignoli	2	4.26	0.017		0.044	0.001
Bembrops heterurus	3	6.38	0.016			0.058
Scomberomorus tritor	4	8.51	0.015	0.044		
Dentex congoensis	4	8.51	0.015		0.004	0.048
Sphoeroides pachgaster	3	6.38	0.014		0.022	0.02
Eucinostomus melanopterus	6	12.77	0.014	0.041		
Gymnura altavela	3	6.38	0.014	0.03	0.01	
Sea urchins (strong spines)	2	4.26	0.014		0.036	
Miracorvina angolensis	2	4.26	0.013		0.033	0.001
Plectorhinchus mediterraneus	3	6.38	0.012	0.027		0.01
Syacium micurum	6	12.77	0.011	0.022		0.014
Lutjanus sp.	7	14.89	0.011		0.029	
Chelidonichthys gabonensis	4	8.51	0.011	0.002	0.018	0.012
Zenopsis conchifer	2	4.26	0.01			0.037
Parapenaeus longirostris	6	12.77	0.009		0.004	0.027
Parapenaeus longirostris, male	5	10.64	0.007		0.004	0.019
S H R I M P S	1	2.13	0.003	0.009		
penaeus notialis, female	1	2.13	0.002	0.005		
penaeus notialis, male	1	2.13	0.001	0.003		
Penaeus notialis	5	10.64	0.001	0.001		
Parapenaeopsis atlantica	1	2.13		0.001		
Other fish		0.231	0	0.302	0.188	0.205
Sum all species		20.082	0	24.102	20.607	14.406
Sum SNAPPERS, JOBFISHES		0.017		0.003	0.042	
Sum GROUPERS, SEABASSES		0.078		0.12	0.098	
Sum GRUNTS, SWEETLIPS		4.12		3.851	7.162	0.239
Sum CROAKERS, DRUMS, WEAKF., KOB		0.68		0.939	0.537	0.559
Sum PANDORAS, PORGIES, SEABREAMS,		2.063		1.346	2.611	2.185
Sum SHARKS, CHIMAERAS		0.036		0.005	0.072	0.026
Sum BATOID FISHES, RAYS		1.232		1.679	1.523	0.281
Sum CEPHALOPODS		0.379		0.089	0.7	0.292
Numbers of stations included in analysis, total and by depth strata		47	0	16	18	13

## B. Benguela - Palmerinhas. Slope (200-500m)

SPECIES NAME	Lower limits, Kg/nm					% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	>0	10	30	100	300			1000	200-300m	300-400m
Merluccius polli	1	4	5			90.91	3.965	2.388	5.356	2.233
Chlorophthalmus atlanticus	6	1	1	2		90.91	3.66	1.634	6.115	0.1
Nematocarcinus africanus		2	3	1		54.55	3.427		2.459	7.649
Trichiurus lepturus	2	1		1		36.36	1.091	5.365	0.01	0.406
Dentex macropthalmus	1		1			18.18	0.804	4.425		
Hoplostethus cadenati	5		1			54.55	0.424		0.037	1.482
Hymenocephalus italicus	8	1				81.82	0.411	0.057	0.587	0.294
Synagrops microlepis	5	1				54.55	0.3	0.937	0.231	0.013
Gadella sp.	7					63.64	0.292	0.15	0.345	0.282
Gephyroberyx darwini	1	2				27.27	0.289	0.726	0.289	
Dentex angolensis			1			9.09	0.274	1.505		
Parapenaeus longirostris, femal	5	1				54.55	0.188	0.645	0.129	
Laemonema laureysi	3	1				36.36	0.174		0.263	0.111
Yarella blackfordi	6					54.55	0.154		0.038	0.488
Stomias boa boa	4					36.36	0.154		0.009	0.546
Zeus faber		1				9.09	0.147	0.811		
Brotula barbata	1	1				18.18	0.144	0.791		
Aristeus varidens, female	7					63.64	0.141		0.045	0.427
Pterothrissus belloci	4					36.36	0.107	0.308	0.094	
Lophiodes kempfi	4					36.36	0.107		0.097	0.197
Gadella imberbis	8					72.73	0.104		0.064	0.254
Helicolenus dactylopterus	4					36.36	0.103		0.19	
Parapenaeus longirostris, male	5					45.45	0.077	0.4	0.007	
Pentheroscion mbizi	1					9.09	0.074		0.136	
Bembrops greyi	2					18.18	0.072	0.397		
Chaunax pictus	6					54.55	0.066		0.062	0.117
Triplophos hemingi	3					27.27	0.066			0.241
Lamprogrammus exutus	2					18.18	0.064			0.235
MYCTOPHIDAE	9					81.82	0.064	0.158	0.054	0.022
Aristeus varidens, male	7					63.64	0.053		0.037	0.119
Raja miraletus	1					9.09	0.052	0.284		
Malacocephalus occidentalis	2					18.18	0.052	0.267	0.005	
Malacocephalus laevis	4					36.36	0.051		0.062	0.061
Scorpaena normani	2					18.18	0.044	0.082	0.054	
Etmopterus polli	3					27.27	0.044		0.08	
Cynoponticus ferox	2					18.18	0.029	0.125	0.011	
Raja clavata	1					9.09	0.018	0.101		
Zenopsis conchifer	2					18.18	0.018	0.004	0.031	
Halosaurus ovenii	5					45.45	0.017		0.012	0.036
Bathyroconger vicinus	3					27.27	0.011		0.02	0.001
Pontinus accraensis	1					9.09	0.011	0.06		
Solenocera africana	3					27.27	0.005		0.002	0.013
Parapenaeus longirostris	2					18.18	0.004		0.008	
Plesiopenaeus edwardsianus	2					18.18	0.002			0.006
S H R I M P S	1					9.09	0.001			0.002
Other fish							0.137	0.263	0.071	0.186
Sum all species							17.49	21.883	17.015	15.519
Sum CROAKERS, DRUMS, WEAKF., KOBS							0.083	0.049	0.136	
Sum PANDORAS, PORGIES, SEABREAMS,							1.078	5.93		
Sum SHARKS, CHIMAERAS							0.046		0.08	0.01
Sum BATOID FISHES, RAYS							0.071	0.385		0.004
Sum CEPHALOPODS							0.019	0.014	0.005	0.048
Numbers of stations included in analysis, total and by depth strata							11	2	6	3

C. Benguela - Palmerinhas. Slope (500-800m)

SPECIES NAME	Lower limits, Kg/nm						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	>0	10	30	100	300	1000			500-600m	600-700m	700-800m
	Nematocarcinus africanus	2	3	3	1					81.82	3.396
Hoplostethus cadenati	5	2	4				100	1.757	2.357	1.576	1.292
Lamprogrammus exutus	6	3	1				90.91	1.229	2.147	1.214	0.321
Yarella blackfordi	6	3	1				90.91	1.196	0.919	0.9	1.696
Stomias boa boa	7	3					90.91	0.678	0.718	0.937	0.443
Triplophos hemingi	7	2					81.82	0.544	0.702	0.373	0.514
Aristeus varidens, female	10	1					100	0.472	0.897	0.153	0.287
Stereomastis sp.	11						100	0.293	0.183	0.125	0.531
Carcharhinus signatus		1					9.09	0.197	0.542		
Gadella maraldi		1					9.09	0.182	0.502		
Talismania longifilis	4	1					45.45	0.18	0.008		0.486
Nezumia aequalis	1	1					18.18	0.154			0.423
Merluccius polli	7						63.64	0.107	0.213	0.066	0.032
OMMASTREPHIDAE	9						81.82	0.105	0.094	0.122	0.103
Bathygadus melanobranchus		1					9.09	0.102			0.281
Aristeus varidens, male	11						100	0.077	0.153	0.025	0.039
Centrophorus granulosus	3						27.27	0.074	0.103	0.133	
Xenodermichthys copei	10						90.91	0.065	0.101	0.047	0.043
Nezumia micronychodon	3						27.27	0.061		0.086	0.103
Yarella corythaeola	1						9.09	0.055		0.203	
Benthodesmus tenuis	6						54.55	0.054	0.133	0.019	0.002
Chaceon maritae, female	2						18.18	0.047	0.123		0.006
Bathyroconger vicinus	7						63.64	0.044	0.013	0.042	0.078
Gadella imberbis	10						90.91	0.044	0.071	0.034	0.023
Nezumia sp.	3						27.27	0.04	0.035		0.076
Etmopterus polli	4						36.36	0.038	0.002	0.138	
Chaunax pictus	4						36.36	0.036	0.097	0.002	
Halosaurus ovenii	7						63.64	0.035	0.025	0.014	0.061
Gadella sp.	4						36.36	0.027	0.059		0.014
Nephropsis atlantica	1						9.09	0.023			0.064
Laemonema laureysi	3						27.27	0.022	0.036	0.003	0.023
Ebinania costaecanarie	1						9.09	0.022			0.061
Chlorophthalmus atlanticus	3						27.27	0.021	0.049	0.012	
Synaphobranchus kaupii	2						18.18	0.02			0.054
Todarodes sp.	1						9.09	0.019			0.053
E C H I N O D E R M A T A	1						9.09	0.017			0.048
Plesiopeneaus edwardsianus	5						45.45	0.016	0.006		0.038
Opisthoteuthis agassizi	1						9.09	0.015			0.042
MYCTOPHIDAE	5						45.45	0.015	0.008		0.033
Stomias affinis	1						9.09	0.015	0.041		
Tetragonurus cuvieri	1						9.09	0.015			0.04
Hymenocephalus italicus	2						18.18	0.014	0.038	0.001	
Lophiodes kempii	1						9.09	0.014			0.039
Dicrolene intronigra	2						18.18	0.014			0.038
Merluccius capensis	1						9.09	0.013			0.037
Scopelosaurus meadi	7						63.64	0.012	0.012	0.016	0.01
Conger conger	3						27.27	0.012	0.019	0.002	0.012
THYSANOTEUTHIDAE	2						18.18	0.012	0.03	0.004	
Nemichthys scolopaceus	6						54.55	0.012	0.015	0.013	0.008
DICERATIIDAE	4						36.36	0.012		0.015	0.021
Gonostoma denudata	1						9.09	0.011			0.031
Centrophorus squamosus	3						27.27	0.011	0.002	0.018	0.016
S H R I M P S	4						36.36	0.009	0.002	0.003	0.022
AcanthePHYRA sp.	3						27.27	0.003	0.003	0.008	
Heterocarpus grimaldii	1						9.09	0.003			0.007
Plesionika martia	1						9.09	0.002		0.008	
Other fish								0.133	0.067	0.082	0.236
Sum all species								11.799	17.287	9.197	8.263
Sum SHARKS, CHIMAERAS								0.329	0.667	0.292	0.019
Sum BATOID FISHES, RAYS								0.013			0.037
Sum CEPHALOPODS								0.159	0.131	0.126	0.212
Numbers of stations included in analysis, total and by depth strata								11	4	3	4

A.- Palmerinhas – Congo River. Shelf 20-200m

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								20-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	12	6	3	3	2		43.33	2.931	1.407	6.336	0.805
Dentex angolensis	16	12	9				61.67	1.186		0.739	2.783
Galeoides decadactylus	7	4	3	1			25	0.86	2.527	0.171	
Synagrops microlepis	1		2	2			8.33	0.713			2.14
Umbrina canariensis	12	3	1	1			28.33	0.566	0.004	1.393	0.232
Trichiurus lepturus	29	7	2				63.33	0.549	0.633	0.577	0.44
Stromateus fiatola	7	1	5				21.67	0.514	0.615	0.912	
Pagellus bellottii	42		2				73.33	0.393	0.612	0.508	0.065
Trachurus trecae	21	5	1				45	0.371		0.54	0.545
Ilisha africana	3			1			6.67	0.359	1.135		
Dentex congoensis	15	10	1				43.33	0.358		0.482	0.568
Chloroscombrus chrysurus	6	4	2				20	0.312	0.839	0.131	
Selene dorsalis	19	2	2				38.33	0.308	0.118	0.186	0.618
Pseudotolithus senegalensis	4	2	2				13.33	0.29	0.436	0.435	
Raja miraletus	45	2					78.33	0.273	0.391	0.353	0.078
Brotula barbata	25	3	1				48.33	0.271	0.002	0.135	0.67
Pomadasys incisus	7			1			13.33	0.247	0.061	0.652	
Zeus faber	39	2	1				70	0.23	0.015	0.178	0.489
Sphyræna guachancho	6	2	1				15	0.19	0.601		
Pomadasys jubelini	2	2	1				8.33	0.189	0.53	0.06	
Pterothrissus belloci	15	1	1				28.33	0.173		0.023	0.494
Trigla lyra	15	1	1				28.33	0.147		0.025	0.414
Pomadasys peroteti	3	1	1				8.33	0.146	0.051	0.371	
Pagrus caeruleostictus	13	2	1				26.67	0.145	0.423	0.03	0.001
Decapterus rhonchus	11		1				20	0.12	0.008	0.332	0.004
Lagocephalus laevigatus	22		1				38.33	0.119	0.045	0.249	0.052
Dentex barnardi	29	2					51.67	0.104	0.102	0.169	0.039
Alectis alexandrinus	6	3					15	0.103	0.31	0.015	
Chelidonichthys gabonensis	4		1				8.33	0.101	0.004	0.283	0.001
Drepane africana	4	2					10	0.099	0.314		
Citharus linguatula	49						81.67	0.09	0.045	0.115	0.106
Lepidotrigla cadmani	11	1					20	0.08		0.121	0.114
Rhinobatos albomaculatus	17						28.33	0.077	0.152	0.082	
Epinephelus aeneus	12						20	0.067	0.092	0.109	
Bembrops greyi	5		1				10	0.067	0.001	0.001	0.2
Grammoplites gruveli	18	1					31.67	0.063	0.036	0.036	0.119
Parapenaeus longirostris,femal	5	1					10	0.063			0.19
Sepia orbignyana	45						75	0.063	0.058	0.119	0.01
G A S T R O P O D S	20	1					35	0.061	0.005	0.001	0.178
Ephippion guttifer	11						18.33	0.06	0.173	0.014	
Dasyatis margarita	6	1					11.67	0.059	0.186		
Chelidonichthys capensis	7	1					13.33	0.058		0.021	0.153
Spicara alta	10	1					18.33	0.056			0.169
Dasyatis marmorata	5	2					11.67	0.053	0.16	0.008	
Miracorvina angolensis	4	1					8.33	0.051	0.003	0.109	0.037
Pagrus auriga	1	1					3.33	0.049	0.013		0.135
Sepia officinalis hierredda	10	1					18.33	0.046	0.134	0.01	
Torpedo torpedo	23						38.33	0.043	0.012	0.091	0.022
Pseudotolithus typus	2	1					5	0.043	0.134		
Squatina oculata	9						15	0.034		0.004	0.098
Fistularia petimba	23						38.33	0.033	0.006	0.049	0.042
Arius parkii	6						10	0.032	0.091	0.009	
Sardinella aurita	16						26.67	0.031	0.08	0.017	
Caelorinchus coelorhincus		1					1.67	0.03			0.091
Parapenaeus longirostris, male	5	1					10	0.029			0.086
Saurida brasiliensis	33						55	0.028		0.037	0.045
Gymnura micrura	3	1					6.67	0.026	0.081		
Alloteuthis africana	22						36.67	0.022	0.006	0.056	0.001
Scorpaena stephanica	13						21.67	0.021	0.003	0.007	0.053
Cynoglossus canariensis	15						25	0.021	0.051	0.014	
Illex coindetii	25						41.67	0.021		0.003	0.059
Cynoponticus ferox	6						10	0.02		0.01	0.049
Pseudupeneus prayensis	12						20	0.02	0.049	0.011	

Sardinella maderensis	11	18.33	0.019	0.04	0.018	
Octopus vulgaris	14	23.33	0.018	0.009	0.03	0.015
Uranoscopus polli	15	25	0.018	0.001	0.003	0.048
Branchiostegus semifasciatus *	8	13.33	0.017		0.006	0.044
Zenopsis conchifer	4	6.67	0.016			0.049
Raja clavata	4	6.67	0.015			0.046
Atractoscion aequidens	4	6.67	0.015		0.031	0.013
Caranx crysos	6	10	0.014	0.023	0.019	
Gymnura altavela	1	1.67	0.014	0.044		
Chaetodon hoefleri	18	30	0.014	0.005	0.028	0.006
Dicologlossa cuneata	11	18.33	0.013	0.012	0.027	0.001
Helicolenus dactylopterus	6	10	0.013		0.001	0.038
Scomberomorus tritor	3	5	0.013	0.016	0.022	
Mustelus mustelus	5	8.33	0.011	0.004	0.015	0.014
penaeus notialis, female	3	5	0.005	0.017		
Penaeus notialis	6	10	0.001	0.004		
penaeus notialis, male	3	5	0.001	0.003		
Solenocera africana	1	1.67	0.001			0.003
Parapenaeopsis atlantica	1	1.67		0.001		
Parapenaeus longirostris	4	6.67				
Other fish			0.284	0.388	0.186	0.288
Sum all species			14.393	13.322	16.726	12.959
Sum GROUPERS, SEABASSES			0.068	0.094	0.11	
Sum GRUNTS, SWEETLIPS			3.527	2.071	7.425	0.817
Sum CROAKERS, DRUMS, WEAKF., KOBBS			0.972	0.577	1.974	0.294
Sum PANDORAS, PORGIES, SEABREAMS,			2.258	1.158	1.972	3.605
Sum SHARKS, CHIMAERAS			0.052	0.02	0.019	0.115
Sum BATOID FISHES, RAYS			0.587	1.097	0.535	0.156
Sum CEPHALOPODS			0.172	0.208	0.217	0.089
Numbers of stations included in analysis, total and by depth strata			60	19	21	20

B.- Palmerinhas – Congo River. Slope (200-500m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								200- 300m	300-400m	400-500m
	>0	10	30	100	300	1000					
Synagrops microlepis	5	2	2	2			64.71	3.333	10.951	0.315	0.002
Nematocarcinus africanus	1	1	3	1			35.29	2.304		1.689	4.84
Merluccius polli	4	8	3				88.24	1.959	1.778	1.633	2.434
Chlorophthalmus atlanticus	7	1	5				76.47	1.666	0.842	3.987	0.033
Trichiurus lepturus	10	1	2				76.47	0.968	2.623	0.15	0.407
Dentex angolensis	1	3	1				29.41	0.686	2.334		
Laemonema laureysi	11	2					76.47	0.476	0.009	0.812	0.53
Pterothrissus bellocci	7		1				47.06	0.368	1.062	0.139	0.019
Brotula barbata	4		1				29.41	0.323	1.058	0.034	
Zenopsis conchifer	4	2					35.29	0.247	0.835		0.004
Parasudis fraser-brueneri	3	1					23.53	0.181	0.49	0.104	
Chaunax pictus	9						52.94	0.178		0.101	0.403
MYCTOPHIDAE	13	1					82.35	0.178	0.525	0.024	0.041
Parapenaeus longirostris, femal	14						82.35	0.176	0.241	0.21	0.088
Hymenocephalus italicus	12						70.59	0.15	0.003	0.1	0.322
Grammoplites gruveli	3	1					23.53	0.148	0.495	0.007	
Malacocephalus occidentalis	9	1					58.82	0.144	0.021	0.345	0.045
Benthodesmus sp.		1					5.88	0.129			0.366
Caelorinchus coelorrhincus	9	1					58.82	0.098	0.271	0.043	0.009
Gephyroberyx darwini	3	1					23.53	0.093	0.006	0.257	
Triplophos hemingi	4	1					29.41	0.081			0.23
Benthodesmus tenuis	8						47.06	0.062		0.026	0.148
Yarella blackfordi	3						17.65	0.053			0.15
Stereomastis sp.	11						64.71	0.05		0.016	0.126
Gadella imberbis	11						64.71	0.049	0.016	0.083	0.043
Lophius vaillanti	3						17.65	0.048	0.016		0.122
Parapenaeus longirostris, male	11						64.71	0.047	0.119	0.033	0.001
Dibranchius atlanticus	9						52.94	0.046		0.005	0.126
Centrophorus granulosus	2						11.76	0.044		0.08	0.044
Epigonus telescopus	10						58.82	0.042	0.062	0.063	0.004
Pontinus accraensis	3						17.65	0.041	0.091	0.041	
Aristeus varidens, female	8						47.06	0.041		0.007	0.108
Gadella sp.	2						11.76	0.04			0.112
Heptranchias perlo	1						5.88	0.033	0.114		
OMMASTREPHIDAE	3						17.65	0.031			0.088
Aristeus varidens, male	8						47.06	0.031		0.01	0.076
Centrophorus squamosus	1						5.88	0.028		0.08	
Todaropsis eblanae	7						41.18	0.025	0.066	0.015	
Bembrops greyi	2						11.76	0.024	0.073	0.008	
L O B S T E R S	3						17.65	0.024	0.074	0.007	
Helicolenus dactylopterus	4						23.53	0.024	0.034	0.038	
G A S T R O P O D S	2						11.76	0.023	0.078		
Illex coindetii	4						23.53	0.022	0.067	0.006	
Malacocephalus laevis	4						23.53	0.021	0.016	0.01	0.035
Raja alba	4						23.53	0.019	0.029	0.012	0.019
Raja clavata	3						17.65	0.018	0.061		
Peristedion cataphractum	10						58.82	0.018	0.044	0.012	0.001
Conger conger	2						11.76	0.017		0.048	
Coloconger cadenati	2						11.76	0.016		0.017	0.03
Bembrops heterurus	2						11.76	0.015	0.051		
Lophiodes kempii	6						35.29	0.014		0.03	0.01
THYSANOTEUTHIDAE	1						5.88	0.014			0.04
Zeus faber	2						11.76	0.014	0.032	0.012	
Torpedo nobiliana	1						5.88	0.013			0.038
CONGRIDAE	3						17.65	0.013		0.032	0.005
Dicologlossa cuneata	2						11.76	0.013	0.043		
Mystriophis rostellatus	2						11.76	0.011		0.032	
Bassanago albescens	4						23.53	0.011	0.002	0.003	0.027
Shrimps, small, non comm.	4						23.53	0.011		0.007	0.024
Stomias boa boa	5						29.41	0.011			0.03
Chascanopsetta lugubris	4						23.53	0.01	0.015	0.017	
Solenocera africana	8						47.06	0.004		0.003	0.009
Glyphus marsupialis	1						5.88	0.004			0.012

S H R I M P S	2	11.76	0.001		0.003	0.001
Aristeus varidens	2	11.76	0.001		0.002	
Plesiopenaeus edwardsianus	1	5.88	0.001			0.002
Other fish			0.136	0.128	0.149	0.13
Sum all species			15.12	24.777	10.859	11.334
Sum CROAKERS, DRUMS, WEAKF., KOBS			0.003	0.011		
Sum PANDORAS, PORGIES, SEABREAMS,			0.686	2.334		
Sum SHARKS, CHIMAERAS			0.129	0.114	0.189	0.082
Sum BATOID FISHES, RAYS			0.051	0.091	0.012	0.057
Sum CEPHALOPODS			0.093	0.137	0.021	0.128
Numbers of stations included in analysis, total and by depth strata			17	5	6	6

C.- Palmerinhas - Congo River. Slope (500-800m)

	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300			1000		
Nematocarcinus africanus	2	2	9	1		77.78	4.107	6.405	4.687	2.31
Yarella blackfordi	10	8				100	0.862	0.692	1.058	0.847
Triplophos hemingi	16	1	1			100	0.776	0.29	2.01	0.308
Lamprogrammus exutus	8	4	1			72.22	0.731	0.72	1.218	0.433
Stereomastis sp.	14	3				94.44	0.53	0.324	0.38	0.752
Stomias boa boa	18					100	0.376	0.394	0.492	0.291
Hoplostethus cadenati	16	2				100	0.369	0.584	0.421	0.201
Nezumia micronychodon	7	1				44.44	0.167	0.006	0.015	0.362
Aristeus varidens, female	18					100	0.153	0.178	0.116	0.159
OMMASTREPHIDAE	12					66.67	0.14	0.033	0.16	0.193
E C H I N O D E R M A T A		1				5.56	0.109			0.246
Bathyroconger vicinus	14					77.78	0.102	0.002	0.025	0.212
Nezumia aequalis	1	1				11.11	0.099			0.223
Merluccius polli	11					61.11	0.089	0.194	0.088	0.024
Xenodermichthys copei	18					100	0.079	0.124	0.107	0.034
THYSANOTEUTHIDAE	4					22.22	0.076	0.002		0.17
Stereomastis sculpta		1				5.56	0.06			0.135
Sea cucumbers	1					5.56	0.053			0.119
Trichiurus lepturus	7					38.89	0.05	0.04	0.104	0.022
Shrimps, small, non comm.	4					22.22	0.048	0.002		0.107
Centrophorus granulosus	3					16.67	0.048	0.123	0.05	
Aristeus varidens, male	17					94.44	0.043	0.099	0.03	0.016
Centroscyrnus crepidater	1					5.56	0.037		0.133	
Talimania longifilis	6					33.33	0.037		0.004	0.081
Gadella sp.	3					16.67	0.036			0.082
Benthodesmus tenuis	11					61.11	0.033	0.101	0.007	0.007
Dicrolene intronigra	11					61.11	0.033	0.002	0.045	0.045
Chaunax pictus	5					27.78	0.03	0.082	0.027	
Chaceon maritae	2					11.11	0.029	0.093		0.006
Caelorinchus coelorhincus	3					16.67	0.02	0.015	0.058	
Halosaurus ovenii	9					50	0.02	0.012	0.006	0.033
Gadella imberbis	7					38.89	0.019	0.049	0.019	0.001
CARISTIIDAE	6					33.33	0.017		0.005	0.036
MYCTOPHIDAE	12					66.67	0.017	0.021	0.012	0.017
Deania calcea	3					16.67	0.015			0.034
Laemonema laureysi	6					33.33	0.014	0.042	0.01	
Dibranchius atlanticus	13					72.22	0.014	0.021	0.013	0.01
J E L L Y F I S H	2					11.11	0.013			0.03
Scopelosaurus meadi	10					55.56	0.012	0.001	0.018	0.015
Nezumia cyrano	1					5.56	0.012			0.026
Alepocephalus rostratus	2					11.11	0.011		0.004	0.022
Plesiopenaeus edwardsianus	6					33.33	0.009	0.022	0.003	0.004
S H R I M P S	3					16.67	0.009	0.014	0.008	0.006
Glyphus marsupialis	8					44.44	0.008		0.002	0.016
Acanthephyra sp.	5					27.78	0.004	0.002	0.009	0.002
Sergestes sp.	1					5.56	0.001	0.004		
Solenocera africana	1					5.56		0.001		
Other fish							0.192	0.129	0.211	0.219
Sum all species							9.708	10.824	11.553	7.858
Sum SHARKS, CHIMAERAS							0.117	0.135	0.225	0.037
Sum BATOID FISHES, RAYS							0.014	0.001	0.003	0.029
Sum CEPHALOPODS							0.227	0.037	0.183	0.373
Numbers of stations included in analysis, total and by depth strata							18	5	5	8



## ANNEX IV Equations

Biomass estimates

The stratified estimator of mean density in the entire area is calculated as (Cochran, 1977)

$$\bar{y}_{st} = \sum_{i=1}^L W_i \bar{y}_i, \quad (1)$$

where

$L$  is the number of strata,

$W_i = \frac{area_i}{total\ area}$  is the proportion of the  $i^{th}$  stratum of the total survey area,

$\bar{y}_i = \frac{\sum_{k=1}^{n_i} y_{i,k}}{n_i}$  is the average density in the  $i^{th}$  stratum

$y_{i,k}$  is the density [tonnes/NM<sup>2</sup>] by the  $k^{th}$  tow in stratum  $i$

$n_i$  is the number of tows in the  $i^{th}$  stratum.

The total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot totalarea \quad (2)$$

The estimated variance of the biomass (var(biomass)) was calculated by:

$$var(biomass) = \left( \sum_{i=1}^L \frac{W_i^2 s_i^2}{n_i} \right) A^2 \quad (3)$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1}, \text{ and } A \text{ is total area}$$

The standard error (SE) of the stratified mean was calculated as (Cochran 1977):

$$SE = \sqrt{var(biomass)} \quad (4)$$

The precision for the estimates (CV) was calculated by (Zar 1999<sup>1</sup>):

$$CV = \frac{SE}{biomass} \quad (5)$$

If the sample size is “large” enough, then the Central Limit Theorem states that each time a survey is conducted there is a 95% chance that the true mean is in the interval (see Cochran<sup>2</sup>, 1977)

$$biomass \pm t_{\alpha/2} SE \quad (6)$$

where  $t$  is from Students t-table with (n-1) degrees of freedom and  $\alpha = 0.025$ .

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<sup>1</sup> Zar JH, 1999, Biostatistical analysis. Prentice Hall, New Jersey, 4. ed., 663 pp.

<sup>2</sup> Cochran, W.G.1977. Sampling Techniques, 3<sup>rd</sup> ed. John Wiley and Sons, N.Y. 228 pp.

## ANNEX V Species codes

### Nansis species codes used in defining the ‘grouped species’ tables

MAIN GROUP	Demersal	Pelagic	Shrimp	Cephalopod	Sharks
	SPA0000	ENG0000	SHR0000	SQU0000	SHA0000
	POD0000	CLU0000			
	SCI0000	CAR0000			
	ARD0000	SCM0000			
	SER0000	SPH0000			
	LUT0000	TRI0000			
	OPDAA00	STRAA00			
	MERME00				
PELAGIC	Clupeids	Carangids	Scombrids	Hairtails	Barracudas
	ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
	CLU0000				
DEMERSAL	Seabream	Snappers	Groupers	Grunts	Croakers
	SPADE00	LUT0000	SER0000	PODPO00	SCI0000
	SPADI00				
	SPALI00				
	SPAPA00				
	SPAPR00				
	SPASP00				
DEEP-WATER	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME04	SHRPEP1	SHRARA1	
	SPALI00	MERME12	SHRPEP2	SHRARA2	
	SPAPA00	MERME13			
	SPAPR00	MERME92			
	SPASA00				
	SPASP00				

## ANNEX VI. Catch rates

Families included under each group:

Demersal: Sciaenidae, Sparidae, Pomadasyidae, Ariidae, Serranidae, Lutjanidae, Merlucciidae, Ophidiidae, Lethrinidae.

Pelagic: Scombridae, Sphyrnidae, Trichiuridae, Clupeidae, Engraulidae, Carangidae.

Cephalopods: squids and octopuses.

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m). C: Slope (201-800 m).

### A. Inner shelf (20-70 m).

Station	Gear depth	Demersal	Pelagic	Cephalopods	Shrimps	Sharks	Other	Total
6	42.5	121.7	4311.1	75.2			1306.3	5814.4
7	26	398.3	6403.4			21.5	1365.4	8188.6
8	22.5		8586	47.8			5574.3	14208.1
9	35		60392.4	369.6			1563.1	62325.1
10	60			4.7			598	602.7
18	23	6.2	3039	79.4		1.8	6409.3	9535.6
23	21.5	1.9	372.1	12.9		1.8	1395.4	1784.1
24	49.5	1.4		1.8			393.2	396.4
25	46	361.5	71.5	49.6			413.9	896.5
Mean	36.2	99	9241.7	71.2		2.8	2113.2	11527.9
Std dev		164.3	19433.4	116.1		7.1	2252.9	19642.3
% Catch		0.9	80.2	0.6			18.3	100.0

### B. Outer shelf (71-200 m).

Station	Gear depth	Demersal	Pelagic	Cephalopods	Shrimps	Sharks	Other	Total
2	173.5	992.7	19275.6				583.4	20851.7
3	146	786.2	18206.1				517.2	19509.6
4	130	661.1	16099.6				66.6	16827.3
11	93.5	10.3	9689.8				116.2	9816.3
12	113	547.4	2862.5				235.7	3645.6
13	136.5	68.5	51.1	3.1			265.7	388.4
19	88	127.6	3017.6					3311.3
20	116.5	637	4758	50.5		13.8	115.7	5708
21	125.5	6.2	7.3	6.7	0.1	2.1	292.5	68.1
26	72	85.8	1060.1	12.5		26.2	39.8	1433.3
Mean	117.3	356.6	6820.7	54.4		3.8	207	7414.5
Std dev		370.9	7651.3	11.6		8.5	221.8	8057.6
% Catch		4.8	92.0	20.6		0.1	188.2	100.0

### C. Slope (201-800 m).

Station	Gear depth	Demersal	Pelagic	Cephalopods	Shrimps	Sharks	Other	Total
1	730.5	9	2	6	1.5	8.8	493.2	520.5

14	337	376.6		1.9	0.3	1	283.5	663.4
15	788	0.7	192.6	8.1	0.5		188.6	390.5
16	346.5	179.4	227.6	6.7	174.5		2701.3	3289.5
22	683	48	0	41.7	58.2	75.6	455.7	679.2
Mean	577	122.7	84.4	12.9	47	17.1	824.5	1108.6
Std dev		159	115.4	16.3	75.5	32.9	1056.6	1224.8
%Catch		11.1	7.6	1.2	4.2	1.5	74.4	100.0

Catch rates (kg/hour) by main demersal groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
6	42.5	60.7					5753.6	5814.4
7	26	64					8124.6	8188.6
8	22.5						14208.1	14208.1
9	35						62325.1	62325.1
10	60						602.7	602.7
18	23	6.2					9529.4	9535.6
23	21.5				1.9		1782.2	1784.1
24	49.5				1.4		395	396.4
25	46	6.3			355.2		535	896.5
Mean	36.2	15.2			39.8		11472.9	11527.9
Std dev		26.9			118.3		19670.9	19642.3
%Catch		0.1			0.3		99.5	100.0

B. Outer shelf (71-200 m)

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
2	173.5				549.3		20302.4	20851.7
3	146				504.6		19005	19509.6
4	130				583.3		16244	16827.3
11	93.5				10.3		9806	9816.3
12	113				537.2		3108.4	3645.6
13	136.5				63		325.5	388.4
19	88				114.1		3197.2	3311.3
20	116.5	16.9			530		5161.1	5708
21	125.5				0.6		67.5	68.1
26	72				85.8		1347.6	1433.3
Mean	117.3	1.5			270.7		7142.2	7414.5
Std dev	29.2	5.1			261.6		7878.6	8057.6
%Catch					3.7		96.3	100.0

Catch rates (kg/hour) by main pelagic groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m).

Station	Gear depth	Clupeids	Engraulidae	Carangids	Barracuda	Hairtails	Scombrids	Other	Total
6	42.5		5.7	4135.5			175.5	1497.6	5814.4
7	26	6047.6	828.3	294.2		52.7	8.9	956.9	8188.6
8	22.5	3063.8	5565.6	5491.7			30.4	56.6	14208.1
9	35	36987.9		23404.5				1932.7	62325.1
10	60							602.7	602.7
18	23	502.8		2536.2				6496.6	9535.6
23	21.5			370.6			1.5	1412	1784.1
24	49.5			0				396.4	396.4
25	46			71.5				825	896.5
Mean	36.2	5178	711.1	4033.8		5.9	24	1575.2	11527.9
Std dev		12109	1840.9	7543.6		17.6	57.7	1935.4	19642.3
%catch		44.9	6.2	35.0		0.1	0.2	13.7	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Clupeids	Engraulidae	Carangids	Barracuda	Hairtails	Scombrids	Other	Total
2	173.5			19275.6				1576.1	20851.7
3	146			18206.1				1303.4	19509.6
4	130	9.2		16090.4				727.7	16827.3
11	93.5			9689.8				126.5	9816.3
12	113			2862.5				783.1	3645.6
13	136.5			51.1				337.4	388.4
19	88			2993.8			23.8	293.8	3311.3
20	116.5			4741.1		16.9		950	5708
21	125.5			5.7			1.6	60.8	68.1
26	72			1040.1			20	373.3	1433.3
Mean	117.3	0.8		6814.2		1.5	4.1	593.8	7414.5
Std dev		2.8		7653.5		5.1	8.8	520.4	8057.6
%Catch				91.9			0.1	8.0	100.0

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. Slope (201-800 m).

Slope (201-800 m)

Station	Gear depth	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africana</i>	Other	Total
1	730.5		4.9		1.5		514.1	520.5
14	337		376.6				286.8	663.4
15	788				0.2		390.2	390.5
16	346.5		179.4		47		3063.1	3289.5
22	683		39.9		42.9		596.4	679.2
Mean	577		120.2		18.3		970.1	1108.6
Std dev			160.8		24.4		1176	1224.8
%Catch			10.84		1.65		87.51	100.00

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Central region.

A: Inner shelf (20-70 m), B: Outer shelf (71-200 m), C: Slope (201-800 m).

A. Inner shelf (20-70 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
29	68	31.1	394.1	234.7		7.3	460.2	1127.4
34	55.5	6.5	743.5	108.5		1	187.7	1047.2
41	70	89.9	241.6	107.2			235.6	674.4
42	55.5	20.5	1907.4	272.3			205.2	2405.3
43	24.5	0.3	154.5	306.5		4.5	94	559.9
44	64.5	5	430.3	119.8			152.3	707.4
50	62.5	55.3	276.5	220.8			145.6	698.2
51	42	4.9	54.9	68.5		4.6	92.7	225.5
52	27		184.8	130.5			361.9	677.2
53	22.5	11.8	478.5	781.8			332.2	1604.4
54	22	9.1	23.7	3.8			65.5	102.1
59	33.5	4.9	129.9	53.9			305.5	494.3
60	50.5	11.5	34.9	258.2	2.5	0.1	63.8	371
62	30	0.2	3.4	63.6			77.1	144.3
63	46	2.9	2.6	18.4		0.1	36.4	60.3
73	48.5	2	1053.4	12			66.8	1134.1
74	27.5	0.3	5.3	46			85.2	136.7
75	32	1.6	99.9	42.2	2.3	0.1	103.5	249.5
76	47.5	0.7	1.3	16.6			48.2	66.9
77	68	13.5	54.5	7.4	13.1		67.9	156.3
83	59.5	20	36				78	134
84	34	3.9	126.8	3			59.7	193.4
86	31		524	4778.4			588.8	5891.2
87	24	0.7	287.5	477.9			79	845.1
88	50.5	9	211.3	44.9			35.2	300.3
91	50.5	15.1	33.4	13.7			58.7	120.9
95	21		26.1	13.4		0.5	15.8	55.7
Mean	43.3	11.9	278.5	303.8	0.7	0.7	151.9	747.5
Std dev		19.7	412.5	911.3	2.6	1.8	142.8	1165.2
% Catch		1.6	37.3	40.6	0.1	0.1	20.3	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
28	92.5	21.7	227.9	309.5		2.6	313	874.7
31	108.5	7.2	102.2	1.4		0	58.6	169.4
32	99	12.3	137.5	0.1		0	112	261.9
33	74.5	1.5	441.7	209.6		0.9	219.7	873.4
40	102.5	15.2	354			0	221.5	590.7
45	111	5.6	156.7	23.6		0	95.8	281.7
46	162.5	3.3	116	7.3	1.2	8.7	230.9	367.3
49	102.5	9.9	72.5	42.5		0	271.4	396.2
55	149.5	8.3	84.3	197.3		26.8	1203.6	1520.4
56	114.5	10.2	99.5	277.6		1.2	392.3	780.8
61	115.5	7.3	168.6	113.2		1.1	132.7	422.9
64	95.5	27.7	270.3	0.3	7.2	0.1	126.6	432.1
65	151	14.2	66.9	32.2		1	63.1	177.4
71	130	3.2	173.8	64.7		0	61.1	302.8
72	94.5	15.6	307.3	141.7		0	113.3	577.8
78	173.5	7.7	36.9	15.8	5.1	0.1	167.7	233.3
81	106	17.8	81	29.8	4.2	0	188.7	321.5
82	85	20.2	15.3	19.3	16.4	0	202.5	273.9
85	94.5	5.4	186.2	0.1		0	90	281.7
90	113	7.6	98	32.1		1.8	108.8	248.3
Mean	113.8	11.1	159.8	75.9	1.7	2.2	218.7	469.4
Std dev		6.9	111	98.3	4	6.1	248.4	329
% Catch		2.4	34.0	16.2	0.4	0.5	46.6	100.0



C. Slope (201-800 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
27	738.5	1	3.7	0.8	0.4	19.1	179.7	204.9
30	733	8.4	18.9			7.4	349.6	384.3
35	482	3	23.2	0.3	1	478.4	209.8	715.7
36	579.5	8.8	77.6		65.3	153.4	388.7	693.9
37	669	5	75.2		12.6	72.6	226	391.3
38	695	4.6	22.8	1.2	0.2	82.1	125.4	236.3
39	265	0.4	375.5	325.5		16.3	249.2	966.9
47	355.5		61.6		12.2	44.1	105.8	223.7
48	385	0.3	190		1.4	238.8	54.1	484.6
57	516	1.4	82.4	1.8	7.5	458.4	101.2	652.7
58	374	0.7	90.7	1.8	0.3	185.5	44.7	323.7
66	315.5		184.2			9.2	583.1	776.5
67	480.5	0.5	0.8			250.9	89.7	341.9
68	738	7.3	3.5	0.2		8.8	86.9	106.7
69	519	3.7	101.3	10.7	0.1	287.7	156.1	559.6
70	340		299.8			13.7	391.4	705
79	609.5	3.4	32.6	0.9	21.2	187.7	101.6	347.4
80	307		175.1			5.1	411.1	591.3
89	536.5	1.9	24.7	3.8	7.3	44.9	100.4	183.1
92	251.5	0.4	194.1	14.1		47.2	142.2	398
93	736.5	8.9	26.6		1.8	66.7	196.9	300.8
94	429.5	1	199.4	37		44.5	108	389.9
Mean	502.5	2.8	102.9	18.1	6	123.8	200.1	453.5
Std dev		3.1	102.5	69.2	14.4	142	141	225
		0.6	22.7	4.0	1.3	27.3	44.1	100.0

Catch rates (kg/hour) by main demersal groups caught in valid swept area bottom trawl hauls on the shelf. Central region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m)

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
29	68.0	16.3	4.6	110.0	64.6		931.8	1127.4
34	55.5	28.6	2.9	361.5	91.7	7.4	555.0	1047.2
41	70.0	2.1		110.4	126.6	0.6	434.7	674.4
42	55.5	114.7		441.7	255.8		1593.0	2405.3
43	24.5	113.7		23.9	1.0		421.3	559.9
44	64.5	52.9		76.5	45.6		532.4	707.4
50	62.5	16.9		101.3	138.4	6.4	435.2	698.2
51	42.0	0.0		9.0	23.8		192.7	225.5
52	27.0	76.2		14.5	12.6		573.8	677.2
53	22.5	156.6		48.0	47.4		1352.4	1604.4
54	22.0				23.7		78.4	102.1
59	33.5	13.2		5.9	4.8	1.6	468.8	494.3
60	50.5	4.9		5.8	4.1		356.2	371.0
62	30.0						144.3	144.3
63	46.0			2.4			57.9	60.3
73	48.5			1014.8	35.5		83.8	1134.1
74	27.5	1.1					135.6	136.7
75	32.0	94.0		0.7			154.8	249.5
76	47.5				1.3		65.6	66.9
77	68.0		36.0	6.5	11.7		102.1	156.3
83	59.5			10.9	22.7	2.1	98.3	134.0
84	34.0			125.9	0.8		66.6	193.4
86	31.0		26.6	80.4	417.0		5367.1	5891.2
87	24.0		4.7	140.0	142.8		557.7	845.1
88	50.5			114.3	96.8	0.2	89.0	300.3
91	50.5		11.0		22.2		87.8	120.9
95	21.0		26.0	0.1			29.7	55.7
Mean	43.3	25.6	4.1	103.9	58.9	0.7	554.3	747.5
Std dev		44.7	9.6	211.5	94.3	1.9	1038.5	1165.2
% Catch		3.4	0.5	13.9	7.9	0.1	74.2	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
28	92.5	39.0			83.0		752.7	874.7
31	108.5				102.2		67.2	169.4
32	99.0	6.3			128.4		127.2	261.9
33	74.5	10.9		229.9	71.5	5.5	555.5	873.4
40	102.5	174.5		4.1	175.3		236.7	590.7
45	111.0				125.0		156.7	281.7
46	162.5	15.9			13.0		338.4	367.3
49	102.5	5.1			43.9		347.2	396.2
55	149.5	6.1			17.8		1496.5	1520.4
56	114.5	7.3			15.0		758.6	780.8
61	115.5	1.4			32.8		388.8	422.9
64	95.5				37.0		395.0	432.1
65	151.0	0.7			43.6		133.0	177.4
71	130.0	3.3			150.5		149.0	302.8
72	94.5				53.1		524.7	577.8
78	173.5				29.4		203.8	233.3
81	106.0	0.4			61.5		259.6	321.5
82	85.0				14.2	0.1	259.6	273.9
85	94.5			1.9	174.8	0.7	104.3	281.7
90	113.0	11.7		0.0	60.1	0	176.4	248.3
Mean	113.8	14.1		11.8	71.6	0.3	371.6	469.4
Std dev		38.8		51.4	53.4	1.2	332.9	329.0
% Catch		3.0		2.5	15.3	0.1	79.2	100.0

Catch rates (kg/hour) by main pelagic groups caught in valid swept area bottom trawl hauls on the shelf. Central region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m).

Station	Gear depth	Barracuda	Carangids	Clupeids	Engraulidae	Hairtails	Scomberids	Other	Total
29	68.0		2.4	1.0		231.2		892.7	1127.4
34	55.5		25.6			82.9		938.7	1047.2
41	70.0		94.3	0.1		12.8		567.2	674.4
42	55.5		192.7			79.5		2133.0	2405.3
43	24.5	9.1	11.4	138.7		147.0		253.7	559.9
44	64.5		38.5	1.3		80.0		587.6	707.4
50	62.5	12.5	183.2	2.7		22.4		477.4	698.2
51	42.0	6.2	23.1	8.3		30.9		157.0	225.5
52	27.0	61.3	38.8	23.3		7.0		546.7	677.2
53	22.5	23.5	151.6	443.3		152.5	10.9	822.6	1604.4
54	22.0		3.8			0.0		98.3	102.1
59	33.5	7.6	10.8	2.9		14.5		458.5	494.3
60	50.5		30.5			227.7		112.8	371.0
62	30.0		63.6					80.7	144.3
63	46.0	3.2	14.8			0.4		41.9	60.3
73	48.5		12.0					1122.2	1134.1
74	27.5	1.5	44.5					90.7	136.7
75	32.0	3.6	0.8	0.5	0.1	6.3	1.3	237.0	249.5
76	47.5	1.3	10.0			4.1	1.2	50.3	66.9
77	68.0		1.2			6.2		148.9	156.3
83	59.5							134.0	134.0
84	34.0		3.0					190.4	193.4
86	31.0		4769.6				8.8	1112.8	5891.2
87	24.0		470.2				7.8	367.2	845.1
88	50.5	20.7	24.2					255.4	300.3
91	50.5		13.5			0.3		107.2	120.9
95	21.0		13.4					42.3	55.7
Mean	43.3	5.6	231.4	23.0		41.0	1.1	445.5	747.5
Std dev		12.8	912.3	88.2		69.7	3.0	477.4	1165.2
% Catch		0.7	31.0	3.1		5.5	0.1	59.6	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeids	Engraulidae	Hairtails	Scomberids	Other	Total
28	92.5					309.5		565.2	874.7
31	108.5					1.4		168.0	169.4
32	99.0		0.1					261.8	261.9
33	74.5		11.6			198.0		663.8	873.4
40	102.5							590.7	590.7
45	111.0		2.8			20.4	0.4	258.1	281.7
46	162.5					7.3		360.0	367.3
49	102.5		11.0			31.5		353.8	396.2
55	149.5		0.6			196.6		1323.1	1520.4
56	114.5					277.6		503.2	780.8
61	115.5					109.5		313.4	422.9
64	95.5		0.3					431.8	432.1
65	151.0					32.2		145.2	177.4
71	130.0		0.2			64.3	0.2	238.1	302.8
72	94.5		141.4	0.2				436.2	577.8
78	173.5					12.2	3.6	217.5	233.3
81	106.0		29.4			0.4		291.7	321.5
82	85.0		5.1			14.2		254.5	273.9
85	94.5		0.1					281.7	281.7
90	113.0		0.5			31.6		216.2	248.3
Mean	113.8		10.2			65.3	0.2	393.7	469.4
Std dev			31.7	0.1		98.8	0.8	262.3	329.0
% Catch			2.2			13.9		83.9	100.0

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf. Central region. Slope (201-800 m).

Slope (201-800 m).

Station	Gear depth	<i>A.varidens</i>	Hake	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Other	Total
27	738.5	14.4					190.5	204.9
30	733	6	4.6				373.7	384.3
35	482	28.4	1.3	449.7			236.2	715.7
36	579.5	8	7.1	145.3			533.5	693.9
37	669	9.9	5.3	61.5			314.7	391.3
38	695	3.7	0.9	78.1			153.6	236.3
39	265		88.3		16.3	278.2	584.1	966.9
47	355.5	2.8	61.6	40.2	1.1		118	223.7
48	385	5.8	190	231.5	1.5		55.8	484.6
57	516	67.6	2.6	390.7			191.7	652.7
58	374	1.9	90.7	183	0.2		47.8	323.7
66	315.5		184.2		9.1		583.2	776.5
67	480.5	9.2		240.2			92.4	341.9
68	738	2.6		5.5			98.6	106.7
69	519	29.1	6.7	258.2			265.6	559.6
70	340	4.6	299.8		9.2		391.4	705
79	609.5	4.6		182.6			160.2	347.4
80	307		151		5.1		435.2	591.3
89	536.5	21.6	9.4	22.6			129.5	183.1
92	251.5		59.6		47.2	92.5	198.6	398
93	736.5	15.6	3.8	50			231.5	300.8
94	429.5	13.4	199.4	30.8			146.3	389.9
Mean	502.5	11.3	62.1	107.7	4.1	16.9	251.5	453.5
Std dev		15.3	87.6	134.7	10.5	61.6	165.3	225
% Catch		2.5	13.7	23.7	0.9	3.7	55.5	100.0

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m), C: Slope (201-800 m).

A. Inner shelf (20-70 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
104	42	20.6	85.9	72.7		2.2	122.7	304.1
105	30	48.3	22.4	38.4		7.7	117.5	234.3
106	28.5	3.2	27.1	99.9		0.1	242.7	372.9
107	44.5	14.8	31.4	475	2.4		300.4	824.1
108	63.5	16.6	1641.5	70.1			105.9	1834.1
116	64.5	6.2	22	21			27.1	76.4
117	41.5	0.2	401.3	145	7.3	0.5	348.3	902.7
118	27.5		318.6	1050.8		0.6	470.5	1840.5
124	22		31.8	293.9		0	38	363.7
125	40.5	5	555.5	388.8		1.8	655.3	1606.3
126	58	0.9	531.3	115.2			41.5	688.9
132	22	0.6	80.9	74.1		0.2	145.8	301.6
133	32.5	0.4	27.2	8			50.9	86.5
141	27	0.3	272.7	33.9			83.5	390.4
142	41.5	0.7	124				61.7	186.3
143	59.5	7.7	19.9	0.3	4.6		50.6	83.1
151	36.5	4.3	14.1	0.3	0		18.4	37.1
152	49	5.9	114.2		2.2		33.5	155.8
171	68	1.8	27.1	21.1			151.2	201.2
172	44.5	4.6	58.7				25.6	88.9
173	22.5		25.7	4.9			20.2	50.9
174	41.5		4.1	1.7			11.7	17.6
180	32.5	0.9	110.7	28		0.1	10.4	150.1
181	43	0.8	54.4	1.8			3.9	60.9
Mean	40.9	6.0	191.8	122.7	0.7	0.6	130.7	452.4
Std dev		10.6	349.4	235.0	1.8	1.6	163.9	559.8
% Catch		1.3	42.4	27.1	0.2	0.1	28.9	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
96	191.5	2.9	400	41.6		123.5	1127	1695
101	146	1.8	104.3	40.5	2	11.9	348	508.5
102	112	3.3	551.1	40.1			70.2	664.7
103	77	14.1	797	397.4			100	1308.5
112	122	3.5	113.7	12.6			46.7	176.5
113	84.5	15.9	1950.5	413.7			132.8	2512.9
114	94	7.8	49.5				37.2	94.5
115	70.5	11	122.2	232.9		0.1	57	423.1
123	117	1.6	280.4	244.4			68.2	594.6
127	70.5	8.9	20.3	12.2		0.1	69.2	110.6
131	198	5.9	83.4	18.7		1.2	531.8	641
134	72	7.7	4.8	8.8			27.9	49.1
135	87.5	7.9	53	0.4			96.3	157.7
136	117	3.3	152.2	70	4.6		70.4	300.6
144	88.5	6.3	80.8	2.9			42.2	132.2
145	116.5	0.3	230.3				31.5	262.2
155	82		578.5	169.2	4.6		17.3	769.6
156	86.5	0.1	116.7	8.5	2.4		8.1	135.7
161	150	4.9	108.6	32.5			131.7	277.8
162	116.5	2.2	181.8	40.4	5.8		158.9	389.1
163	108	0.4	250.9	3.3	8.2		61.4	324.3
164	90	0.6	22.4	1.2			194.7	218.8
165	117	0.4	160.1	24.8	13.9		36.5	235.7
166	184	8.8	72.3	11.7	1.9	19.3	268.4	382.5
175	82	0.4	90.3	65.9			9.2	165.9
176	96	6.1	95.3	40.7		0.4	44.2	186.6
177	108.5	2	26.4	56.3	4.2	0.9	36.2	126
182	72.5	4.6	172.2	22.1			20.3	219.3
183	92.5	0.3	781.2	15.1			22.2	818.8
184	110.5	2.2	115	73	2.9		34.9	227.9
185	119	0.6	70				25.4	96.1
189	126	3.8	77.7	1.6	9.5		15	107.6
190	116	3.7	26.4	26.9	11.7	0.2	37.9	106.7
Mean	109.7	4.3	240.6	64.5	2.2	4.8	120.6	437
Std dev		4.1	369.8	106.7	3.7	21.7	211.1	517.6
% Catch		1.0	55.1	14.8	0.5	1.1	27.6	100.0



C. Slope (201-800 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
97	212.5		451	2.7		11.1	441.6	906.3
98	700.5	12.7	1.4	4.4		175.2	59.8	253.6
99	512.5		16.9	3.9		357.9	41.5	420.2
100	417		26.6	4.4	5.6	300.7	67.2	404.5
109	450.5	0.1	125.2	7.7	0.1	235.3	62	430.5
110	509.5		23.5	7.1	0.4	278.7	66.2	375.7
111	727.5	28.9	5.5	0.4		121	103.3	259
119	304.5		42.9	4.4		4.6	216.6	268.6
120	425		92.4	12.8	7.9	257.5	69.3	439.9
121	608.5	3.5	103.5	2.2	0.8	237.3	365.7	713
122	703	27.5	51.7	0.7		194.5	186.9	461.3
130	626	7.9	24.8	0.6		234.5	85.6	353.4
137	306	1	83.4	2.5		7.2	273.8	367.9
138	376	1.1	53.9	8.3	14.6	309.8	82.9	470.5
139	633.5	10.3	32.1	11.5	0.2	166.9	110.4	331.4
140	752.5	9.2	2.1	0.5	0.7	64.8	121.7	198.9
146	426	18.3	76.8	68.2		77.3	146.8	387.4
147	534	2.1	43	5.2	14.1	190	119.3	373.6
148	703		43.6	0.6		24.8	165.7	234.7
149	531	2	34	3.4	4.6	143.5	117.8	305.4
150	412.5		54.3	66.1		31	60.1	211.6
154	233.5	3.3	184.8	24.5	15.7	0	690.6	918.9
157	629.5	2.3	21.7	1.7	25.2	14.6	87.3	152.7
158	777.5	4.3	3.5	0	5.2	3	186.1	202.2
159	312	1	40.2	8.8		10.5	184.6	245.1
160	264	2.6	46.8	18.3		1.6	264.2	333.6
167	269.5	4.7	16	159		25.2	597.1	802
168	439	3.6	53.5	0.5	1.1	11.2	47.8	117.8
169	524.5	1.4	20.3	1.2	1.3	13.3	78.9	116.4
170	723	0.9	5.1	0	2.4	12.2	102.6	123.2
178	330	0.6	46.9	4.8	3.2	9.9	189.5	254.9
179	659	3.3	8.6	0.5	7.2	58	33.4	111
186	351.5		28.6	2.3	16.6	14	264.8	326.3
187	755	2.2	0.9	0.1		4.8	34.3	42.3
188	231.5	8.5	52.4	158.9		12.6	317.4	549.8
Mean	496.3	4.7	54.8	17.1	3.6	103.3	172.7	356.1
Std dev		7.2	79	38.7	6.2	113.3	153.9	212.5
% Catch		1.3	15.4	4.8	1.0	29.0	48.5	100.0

Catch rates (kg/hour) by main demersal groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m)								
Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
104	42	2	0.7	21.3	4.5		275.7	304.1
105	30		0.5		1.3		232.6	234.3
106	28.5	1.1		5.5			366.3	372.9
107	44.5		0.9	14.6	13.9		794.7	824.1
108	63.5	277.6		183.8	31.7		1341	1834.1
116	64.5	0			20.7		55.7	76.4
117	41.5	77.6		239.5	0.3		585.3	902.7
118	27.5	177.4		7.7			1655.4	1840.5
124	22	0.8		5.4	3.5		354	363.7
125	40.5	68.9		77.2	12.9		1447.4	1606.3
126	58			391.1	20.7		277.1	688.9
132	22	15.7	0.1	9.9			275.9	301.6
133	32.5			10.8	16.4		59.3	86.5
141	27		24.9		247.8		117.7	390.4
142	41.5		0.8		123.2		62.3	186.3
143	59.5				19.9		63.2	83.1
151	36.5				14.1		22.9	37.1
152	49		1.5		108.3		45.9	155.8
171	68			0.7	26.3		174.1	201.2
172	44.5		21.2		37.4		30.3	88.9
173	22.5				25.7		25.2	50.9
174	41.5				4.1		13.4	17.6
180	32.5	2.2					147.9	150.1
181	43		4		48.9		8	60.9
Mean	40.9	26	2.3	40.3	32.6		351.3	452.4
Std dev		67	6.5	96	55.6		478.8	559.8
% Catch		5.7	0.5	8.9	7.2		77.7	100.0

B. Outer shelf (71-200 m)

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
96	191.5				211.1		1483.9	1695
101	146	0.9			57.3		450.3	508.5
102	112	32.6			111.3		520.9	664.7
103	77			11.7	28.7		1268.1	1308.5
112	122	27.4			61.1		87.9	176.5
113	84.5	24.3			28.1		2460.5	2512.9
114	94				48.1		46.3	94.5
115	70.5		4.3	60.1	44.5		314.3	423.1
123	117	37.3			125		432.3	594.6
127	70.5	1.1	0.5		18.5		90.5	110.6
131	198	13			36.3		591.7	641
134	72				4.8		44.4	49.1
135	87.5				23		134.6	157.7
136	117	3.8			121		175.8	300.6
144	88.5				43.3		88.9	132.2
145	116.5				212.9		49.3	262.2
155	82	411.3	19.4		128.9		210	769.6
156	86.5				25.5		110.2	135.7
161	150	16.8			65.7		195.3	277.8
162	116.5				137.2		252	389.1
163	108			7.1	181.3		135.9	324.3
164	90				21.9		196.8	218.8
165	117				118.8		116.9	235.7
166	184	32.5			27.9		322	382.5
175	82	10.3			8.4		147.2	165.9
176	96	50.2			16.5		119.9	186.6
177	108.5	6.6			10.2		109.1	126
182	72.5	43	18.5	3.4	57.6		96.8	219.3
183	92.5	381.1	23		287.7		127	818.8
184	110.5	0.6			64.4		162.8	227.9
185	119				39.2		56.9	96.1
189	126				53.5		54.1	107.6
190	116				21.9		84.8	106.7
Mean	109.7	33.1	2	2.5	74		325.4	437
Std dev		94.9	6	10.6	69.2		500.2	517.6
%Catch		7.6	0.5	0.6	16.9		74.5	100.0

Catch rates (kg/hour) by main pelagic groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m)

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
104	42	3.2	39.7	1.5	27.8		231.9	304.1
105	30	4.4	10.4	0.1	23.5		196	234.3
106	28.5	25.5	60.3	2.2	6.6		278.4	372.9
107	44.5	79.2	187				557.9	824.1
108	63.5		39	8.3	25.2		1761.7	1834.1
116	64.5			0.3	3.8		72.3	76.4
117	41.5	4.5	9.2	0.2	84.8		804.1	902.7
118	27.5	167.1	176.2	686.8	19		791.3	1840.5
124	22	2	145.5	27.7	118.7		69.8	363.7
125	40.5	55	121.3	3.6	93.2		1333.3	1606.3
126	58	1.4	98.5	0.4	3.2		585.4	688.9
132	22	26.2	15.7	29.8	2.4		227.5	301.6
133	32.5		6.8	1.2			78.5	86.5
141	27	4.5	23	0.9		5.5	356.5	390.4
142	41.5						186.3	186.3
143	59.5		0.3				82.8	83.1
151	36.5			0.3			36.8	37.1
152	49						155.8	155.8
171	68		4.5			16.6	180.1	201.2
172	44.5						88.9	88.9
173	22.5		3.6		1.3		46	50.9
174	41.5		1		0.8		15.8	17.6
180	32.5	3.6	9.2	6.2	2.5	4.3	124.2	150.1
181	43		1.7	0.1			59.1	60.9
Mean	40.9	15.7	39.7	32.1	17.2	1.1	346.7	452.4
Std dev		37.7	59.6	139.7	33.1	3.6	438.2	559.8
% Catch		3.5	8.8	7.1	3.8	0.2	76.6	100.0

B: Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
96	191.5				41.6		1653.3	1695
101	146				40.5		468	508.5
102	112		21.6		18.5		624.6	664.7
103	77		22.2	0.2	199		1087.2	1308.5
112	122		6.6		6.1		163.9	176.5
113	84.5		269.1	15	21.9		2207	2512.9
114	94						94.5	94.5
115	70.5		0.1	0.9	18.6		403.5	423.1
123	117		194.9		49.5		350.2	594.6
127	70.5		6.3		5.9		98.4	110.6
131	198				15.7	3	622.3	641
134	72		6.8		1.9		40.4	49.1
135	87.5		0.4				157.3	157.7
136	117		70				230.6	300.6
144	88.5		2.8	0.1			129.3	132.2
145	116.5						262.2	262.2
155	82		149.7		19.5		600.4	769.6
156	86.5		8.5				127.3	135.7
161	150		24.5		8.1		245.3	277.8
162	116.5		40.4				348.7	389.1
163	108		2.8		0.5		321	324.3
164	90		1.2				217.6	218.8
165	117		18.4		6.4		210.9	235.7
166	184				11.7		370.7	382.5
175	82		41.4		17.8		106.6	165.9
176	96		7.3		33.3		145.9	186.6
177	108.5		7.4		48.9		69.7	126
182	72.5		18.3	0.1	3.7		197.2	219.3
183	92.5		15.1				803.7	818.8
184	110.5		73				154.9	227.9
185	119						96.1	96.1
189	126		1.4		0.2		106	107.6
190	116		26.1		0.7		79.8	106.7
Mean	109.7		31.4	0.5	17.3	0.1	387.7	437
Std dev			60.5	2.6	36	0.5	467.1	517.6
% Catch			7.2	0.1	4.0		88.7	100.0

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. Slope (201-800 m).

Station	Gear depth	<i>A.varidens</i>	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Other	Total
97	212.5			11.1	77.5	817.7	906.3
98	700.5	0.7	174			79	253.6
99	512.5	13.4	343.9			62.9	420.2
100	417	1.9	294.9	3.8		103.9	404.5
109	450.5	4.4	228.5	1.5		196.2	430.5
110	509.5	12.6	263.4			99.7	375.7
111	727.5	1.9	118.7			138.4	259
119	304.5			4.4		264.1	268.6
120	425	1.3	253.1	2.7		182.8	439.9
121	608.5	8.9	227.3			476.7	713
122	703	3.4	190.4			267.5	461.3
130	626	4.2	229.1			120.2	353.4
137	306	1.8		4.5		361.6	367.9
138	376	1.3	307.3	1.1		160.7	470.5
139	633.5	3.3	163.1			165	331.4
140	752.5	16	48.7			134.2	198.9
146	426	13.9	60.9			312.6	387.4
147	534	4.2	185.5			183.9	373.6
148	703	9.4				225.3	234.7
149	531	4.8	136.4			164.2	305.4
150	412.5	3.3	20.1	7.6		180.5	211.6
154	233.5				162.8	756.1	918.9
157	629.5	2.3	11.8			138.6	152.7
158	777.5	0.7				201.5	202.2
159	312	0.2		10.3		234.6	245.1
160	264			1.6	41.3	290.6	333.6
167	269.5			25.2	1.3	775.5	802
168	439	7.1				110.7	117.8
169	524.5	5.8	7			103.6	116.4
170	723	4.4				118.7	123.2
178	330			9.3		245.6	254.9
179	659	2.3	55.7			53	111
186	351.5	0.2		13.2		312.9	326.3
187	755	2				40.3	42.3
188	231.5			12.6	48.2	489.1	549.8
Mean	496.3	3.9	94.9	3.1	9.5	244.8	356.1
Std dev		4.4	114.4	5.6	31.3	197.9	212.5
% Catch		1.1	26.6	0.9	2.7	68.7	100.0

## **ANNEX VII Instruments and fishing gear used**

The Simrad ER-60/18, 38, 120 and 200 kHz scientific sounder was run during the survey only for observation of fish and bottom conditions. No scrutinizing of the recordings was done.

Last standard sphere calibrations were carried out 07.03.2010 in Baia dos Elefantes using Cu-64, Cu-60, WC-38.1 add WC-38.1 spheres for 18, 38, 120 and 200 kHz, respectively. The details of the settings of the 38 kHz echo sounder where as follows:

### **Transceiver-2 menu (38 kHz)**

Transducer depth	5.50 m
Absorbtion coeff.	8,5 dB/km
Pulse duration	medium (1,024ms)
Bandwidth	2,43 kHz
Max power	2000 Watt
2-way beam angle	-20,6dB
gain	25,23 dB
SA correction	-0,51 dB
Angle sensitivity	21.9
3 dB beamwidth	7,35° along ship 7,31° athwardship
Alongship offset	-0.05°
Athwardship offset	0.06°

**Bottom detection menu**      Minimum level -40 dB

## Fishing gear

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super bottom trawl". During the present survey only the bottom trawl was used.

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the codend with an inner net of 10 mm mesh size. The trawl height was about 4.5 m and distance between wings during towing about 21 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. Since 19.02.08 new and heavier "Thyborøn" combi trawl doors (7.41 m<sup>2</sup>, 1720 kg) have been in used. During the present survey the door distance was kept nearly constant at about 50 m at all depths by the use of a 9 m strap between the wires at 120 m distance from the doors (normally applied at depths greater than 80 m). At depths greater than 300 m the trawl was equipped with a tickler chain, which improves the catchability of bottom living and borrowing species, particularly shrimps.

The SCANMAR system was used on all trawl hauls. This equipment consists of sensors, a hydrophone, a receiver, a display unit and a battery charger. Communication between sensors and ship is based on acoustic transmission. The doors are fitted with sensors to provide information on their distance, and the trawl was equipped with a trawl eye that provides information about the trawl opening. A catch sensor on the cod-end indicated the size of the catch.



## ANNEX VIII Station allocation by survey and depth strata

Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 1985-2009.

	1985.1	1985.2	1985.3	1985.4	1986.1	1986.2	1989.1	1989.2	1989.3	1991.1	1991.2	1992	1993	1994	1995.1	1995.2	1996	1997.1	1997.2	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
OUTSIDE	11	13	13	11	28	24	31	23	10	30	56	55	1	17	16	0	5	1	62	0	0	1	0	0	1	0	3	0	1	0	0	
20-50south	0	2	0	0	6	3	5	2	3	6	2	4	3	0	0	0	0	0	0	0	0	8	0	2	4	8	7	8	5	6	9	
50-100south	0	1	0	0	8	6	8	8	1	14	12	20	11	0	0	0	0	0	4	0	0	9	0	5	7	7	5	5	8	8	6	
100-200south	0	0	0	0	8	3	9	8	6	10	12	7	9	0	0	0	0	0	6	0	0	7	0	3	7	5	7	7	7	7	7	
200-300south	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	
300-400south	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	1	0	1	2	2	1	1	1	2	2	
400-500south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
500-600south	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	
600-700south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	2	3	1	2	2	1	1	
700-800south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2	2	
20-50central	0	0	0	3	8	11	17	24	5	17	13	15	0	9	14	0	10	6	1	9	14	23	12	16	16	17	16	16	15	17	16	
50-100central	0	0	0	4	15	14	21	29	4	26	13	16	0	12	13	0	12	9	10	17	19	27	18	18	19	18	20	18	20	18	18	
100-200central	0	0	0	2	2	4	13	11	3	15	10	12	0	14	15	12	12	8	13	12	14	22	16	15	13	14	14	16	15	14	14	
200-300central	0	0	0	4	3	1	4	3	3	10	6	8	0	8	9	21	9	7	11	8	8	12	4	2	3	2	6	3	2	2	1	
300-400central	0	0	0	2	4	1	0	7	1	7	3	9	0	9	11	15	10	7	1	6	6	10	4	6	4	6	6	6	6	6	6	
400-500central	0	0	0	4	5	0	3	4	3	6	3	7	0	8	9	18	9	7	0	4	6	8	6	2	3	3	4	3	2	3	3	
500-600central	0	0	0	1	2	0	1	2	4	1	0	9	0	5	7	14	8	7	0	7	5	9	3	5	3	3	5	4	5	4	4	
600-700central	0	0	0	0	0	0	0	0	0	0	0	6	0	1	3	10	3	0	0	5	1	6	3	4	4	4	4	6	4	4	3	1
700-800central	0	0	0	0	0	0	0	0	0	0	0	4	0	2	4	1	4	0	3	0	7	4	4	4	4	4	6	4	5	5	6	
20-50north	5	4	7	6	14	13	3	14	3	7	8	12	0	9	9	0	9	8	0	0	14	11	11	16	13	15	14	14	17	17	17	
50-100north	9	8	7	7	25	28	19	33	14	20	19	17	0	9	12	0	12	10	4	0	24	24	14	23	20	24	20	18	21	19	20	
100-200north	5	5	3	6	5	20	6	6	4	11	12	10	0	11	11	0	12	11	8	0	29	24	18	23	20	21	21	17	23	23	20	
200-300north	1	0	1	5	5	6	8	6	4	4	14	9	0	8	7	0	10	9	3	0	12	11	7	7	7	8	7	6	7	7	7	
300-400north	0	0	5	6	15	4	2	4	4	6	6	5	0	9	8	0	9	8	2	0	12	10	11	6	6	6	6	5	5	4	5	
400-500north	0	0	1	2	3	6	5	4	4	6	2	6	0	6	4	0	8	7	0	0	7	8	5	6	6	6	6	5	6	6	6	
500-600north	0	0	3	3	3	3	3	6	0	1	0	5	0	5	5	0	10	8	0	0	6	7	8	6	6	6	7	4	6	6	7	
600-700north	0	0	0	0	1	0	0	1	0	0	3	0	2	3	0	0	0	0	0	1	7	5	6	6	6	7	8	4	8	6	6	
700-800north	0	0	0	0	0	1	0	0	0	0	0	4	0	3	2	0	5	5	0	0	8	3	9	9	8	9	7	6	7	7	7	
TOTAL	31	33	40	66	161	148	159	194	77	200	193	245	24	147	162	91	157	118	126	71	178	264	152	186	185	200	208	179	198	193	191	

## ANNEX IX Angolan Monitoring Lines

#	Location	Estação	Latitude ( S )	Longitude ( E )	Depth (multinet)	Depth (bottles)
1	Namibe	NML002	15°09.381'	12°07.827'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Namibe	NML003	15°09.381'	12°04.725'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Namibe	NML004	15°09.381'	11°59.554'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Namibe	NML005	15°09.381'	11°49.216'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Namibe	NML006	15°09.381'	11°39.000'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Namibe	NML007	15°09.381'	11°17.360'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Lobito	LBML	12°20.91'	13°28.60'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Lobito	LBML	12°20.15'	13°27.16'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Lobito	LBML	12°17.90'	13°22.20'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Lobito	LBML	12°13.00'	13°13.02'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Lobito	LBML	12°08.80'	13°04.00'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Lobito	LBML	12°04.10'	12°54.80'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Lobito	LBML	11°58.75'	12°45.45'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
8	Lobito	LBML	11°54.80'	12°36.66'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Luanda	LDML	9°05.00'	12°58.314'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Luanda	LDML	9°05.00'	12°56.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Luanda	LDML	9°05.00'	12°51.26'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Luanda	LDML	9°05.00'	12°41.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Luanda	LDML	9°05.00'	12°31.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Luanda	LDML	9°05.00'	12°21.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Luanda	LDML	9°05.00'	12°11.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Congo River	CRML	6°12.453'	12°07.976'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Congo River	CRML	06°13.359'	12°04.536'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Congo River	CRML	06°15.434'	11°55.580'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Congo River	CRML	06°17.712'	11°45.802'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Congo River	CRML	06°19.670'	11°36.265'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Congo River	CRML	06°21.922'	11°26.555'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Congo River	CRML	06°24.195'	11°16.470'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
8	Congo River	CRML	06°26.254'	11°06.790'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
9	Congo River	CRML	06°28.65'	10°56.55'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
10	Congo River	CRML	06°30.59'	10°46.12'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75

